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(12) **United States Patent**
Khan et al.

(10) **Patent No.: US 12,303,827 B2**
(45) **Date of Patent: May 20, 2025**

(54) **FOOD WASTE DISPOSER**

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(73) Assignee: **SAMSUNG ELECTRONICS CO., LTD.**, Suwon-si (KR)

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(21) Appl. No.: **17/894,710**

(22) Filed: **Aug. 24, 2022**

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Related U.S. Application Data

(63) Continuation of application No. PCT/KR2022/010980, filed on Jul. 26, 2022.

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Oct. 26, 2021 (KR) 10-2021-0143780
Dec. 20, 2021 (KR) 10-2021-0182618

(51) **Int. Cl.**
B01D 5/00 (2006.01)
B01D 46/00 (2022.01)
(Continued)

(52) **U.S. Cl.**
CPC ***B01D 53/265*** (2013.01); ***B01D 5/0015*** (2013.01); ***B01D 5/009*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC .. B01D 5/0015; B01D 5/009; B01D 46/0038; B01D 53/007; B01D 53/265; B01D 53/88; B65F 1/14
See application file for complete search history.

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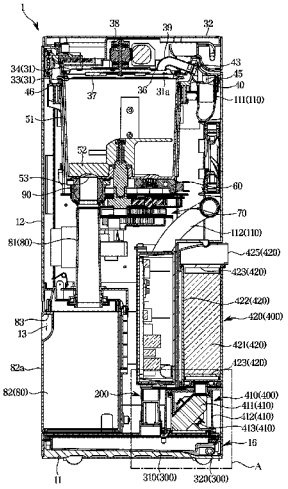
(74) *Attorney, Agent, or Firm* — STAAS & HALSEY LLP

(57) **ABSTRACT**

A food waste disposer including a housing, a container disposed inside the housing and provided to accommodate food waste, an exhaust duct communicating with the container and provided to allow exhaust gas generated in the container to flow therein, a filter device including a catalytic filter part configured to filter the exhaust gas passed through the exhaust duct, and a deodorizing filter part configured to filter the exhaust gas passed through the catalytic filter part and communicating with an outside of the housing, and a condensation chamber configured to remove moisture in the exhaust gas flowing from the exhaust duct into the catalytic filter part of the filter device.

14 Claims, 23 Drawing Sheets



(51) **Int. Cl.**

B01D 53/00	(2006.01)
B01D 53/26	(2006.01)
B01D 53/88	(2006.01)
B65F 1/14	(2006.01)
B02C 18/00	(2006.01)
B02C 18/16	(2006.01)

(52) **U.S. Cl.**

CPC ***B01D 46/0038*** (2013.01); ***B01D 53/007*** (2013.01); ***B01D 53/88*** (2013.01); ***B65F 1/14*** (2013.01); *B01D 2255/802* (2013.01); *B01D 2273/30* (2013.01); *B02C 18/0092* (2013.01); *B02C 18/16* (2013.01); *B65F 2210/137* (2013.01)

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FIG. 1

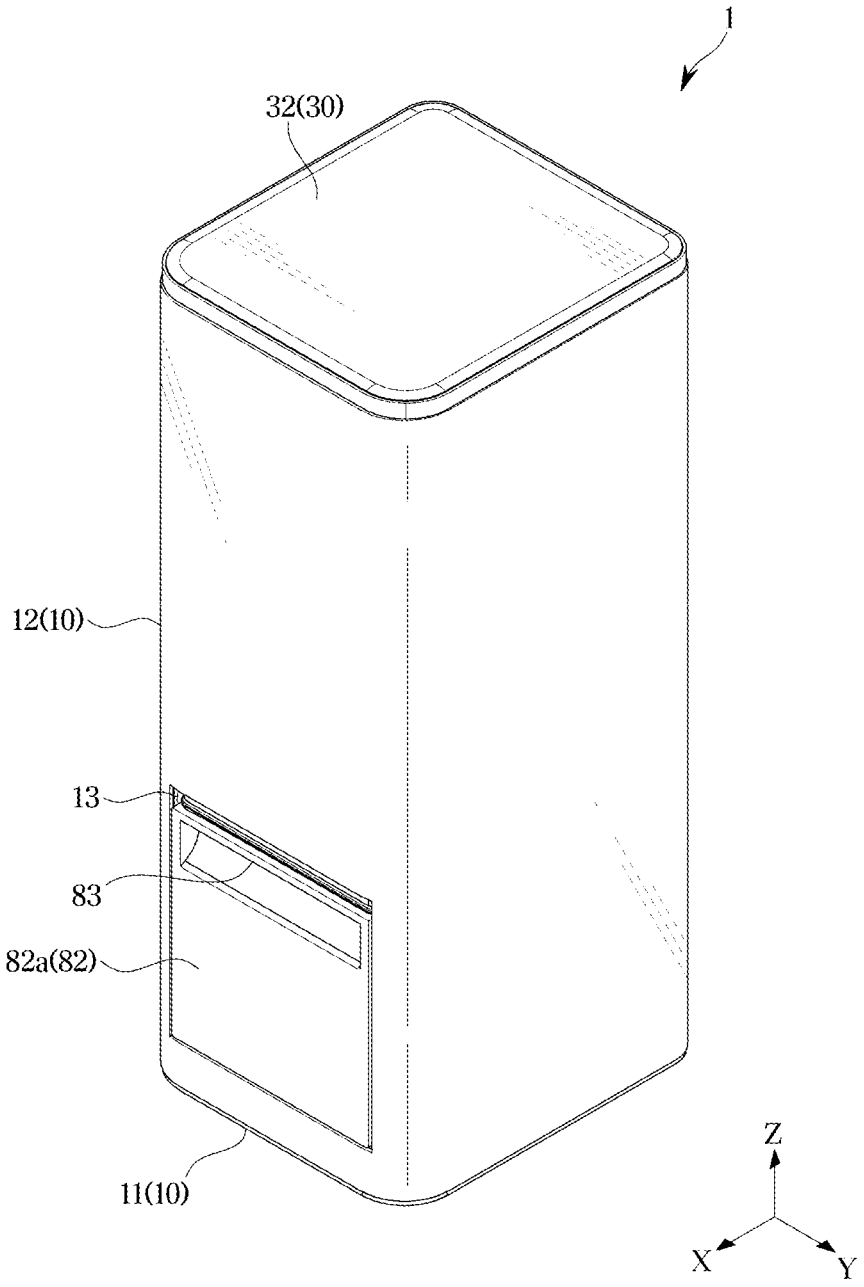

FIG. 2

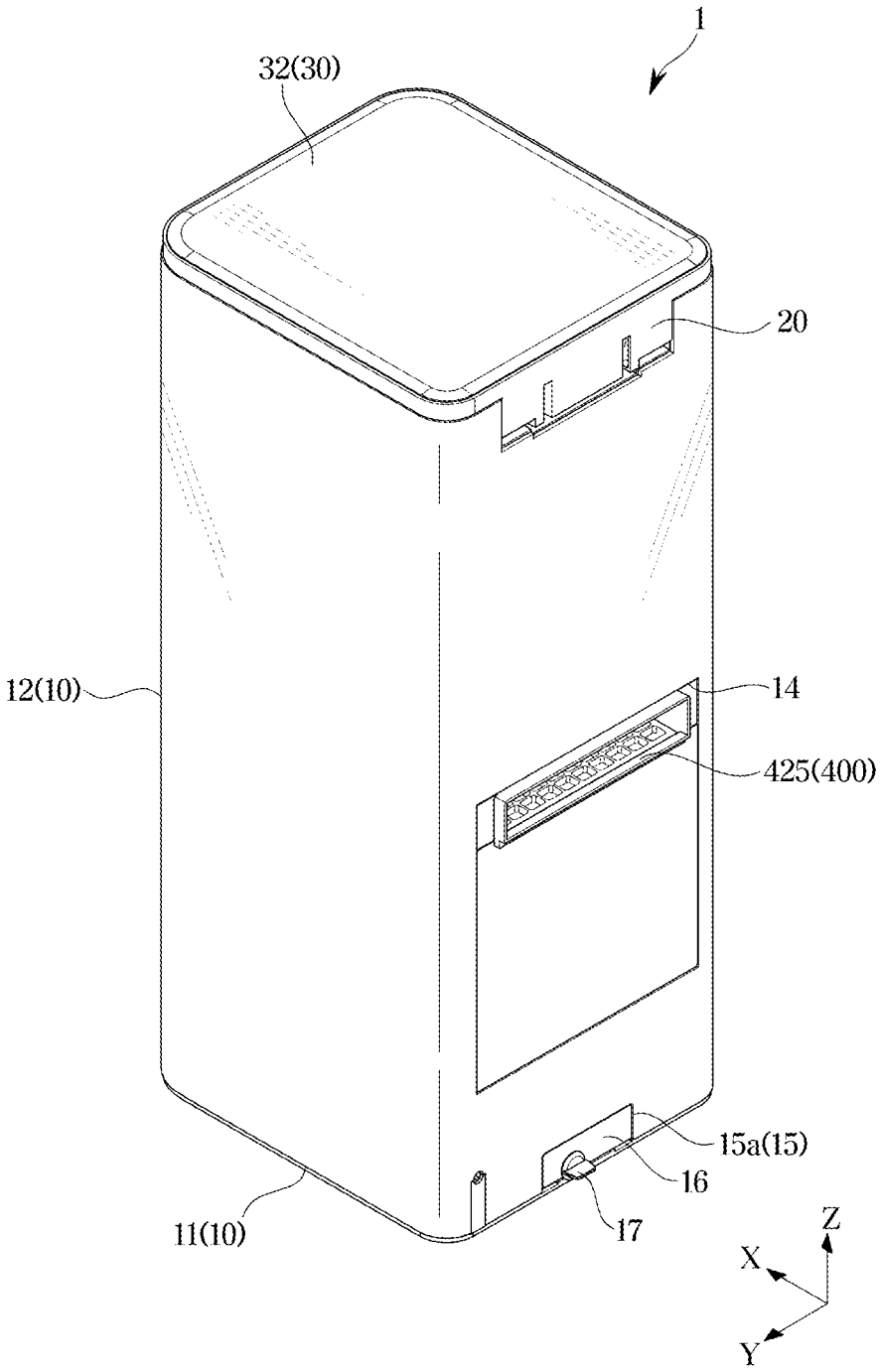

FIG. 3

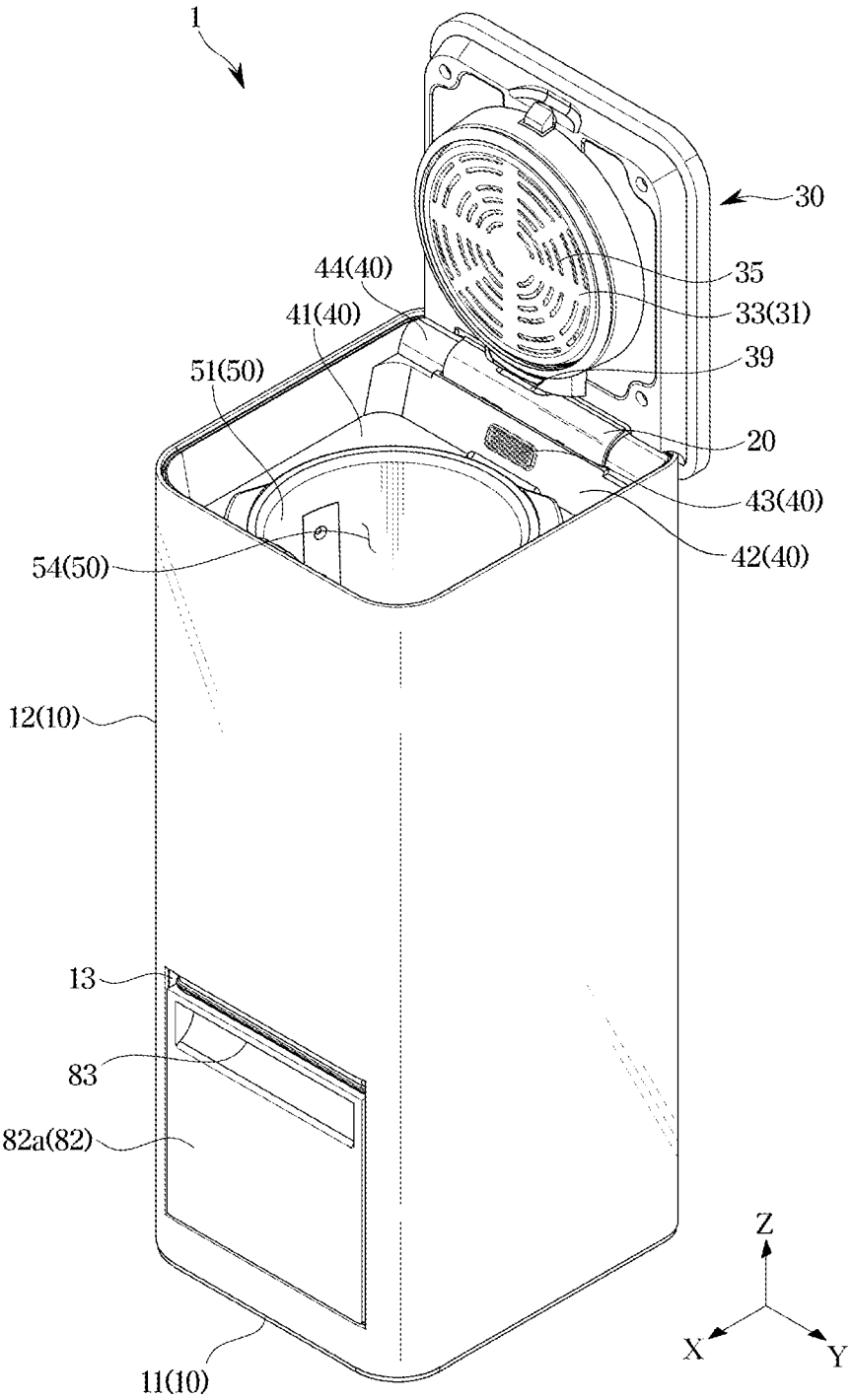
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FIG. 4

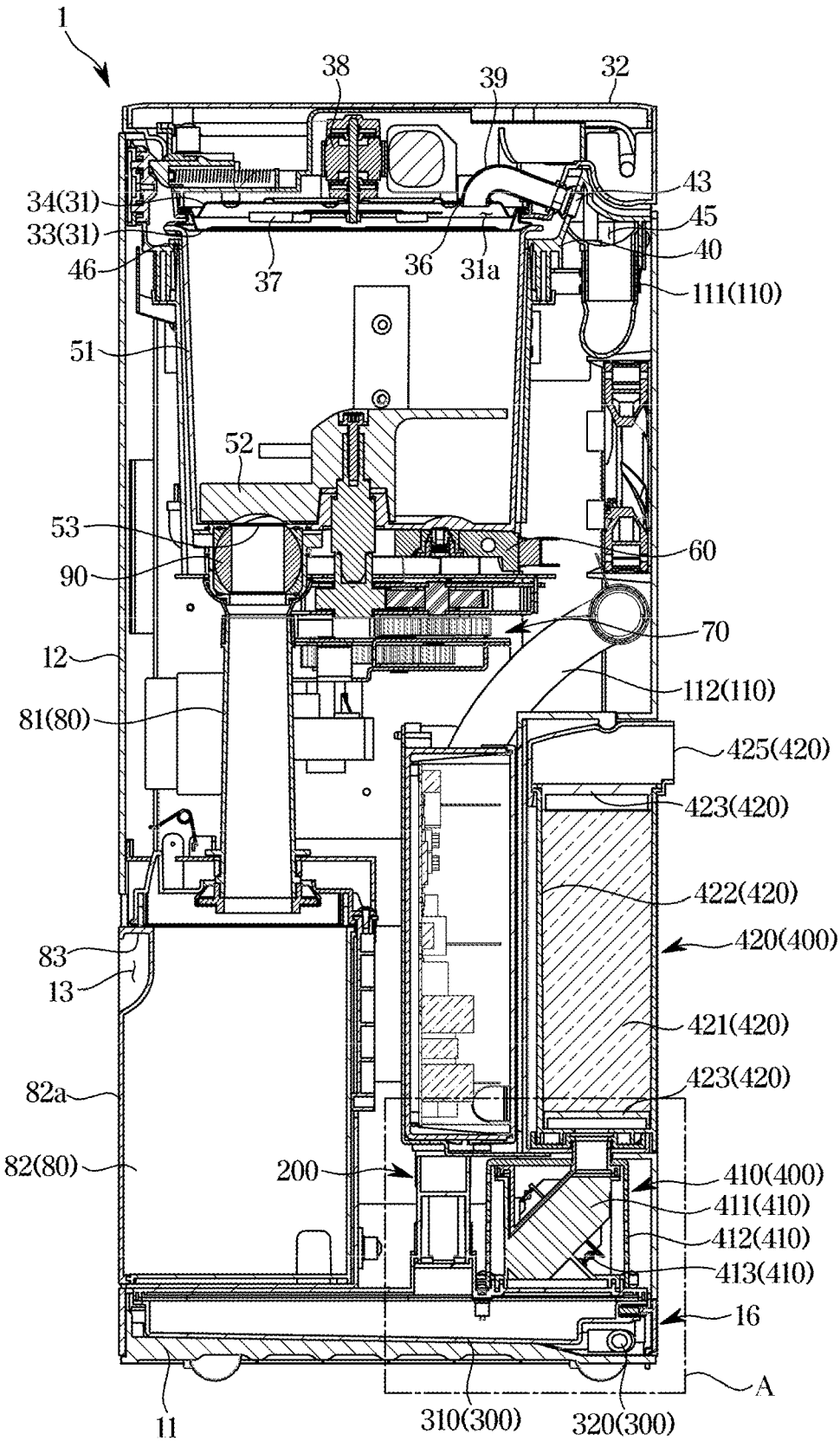
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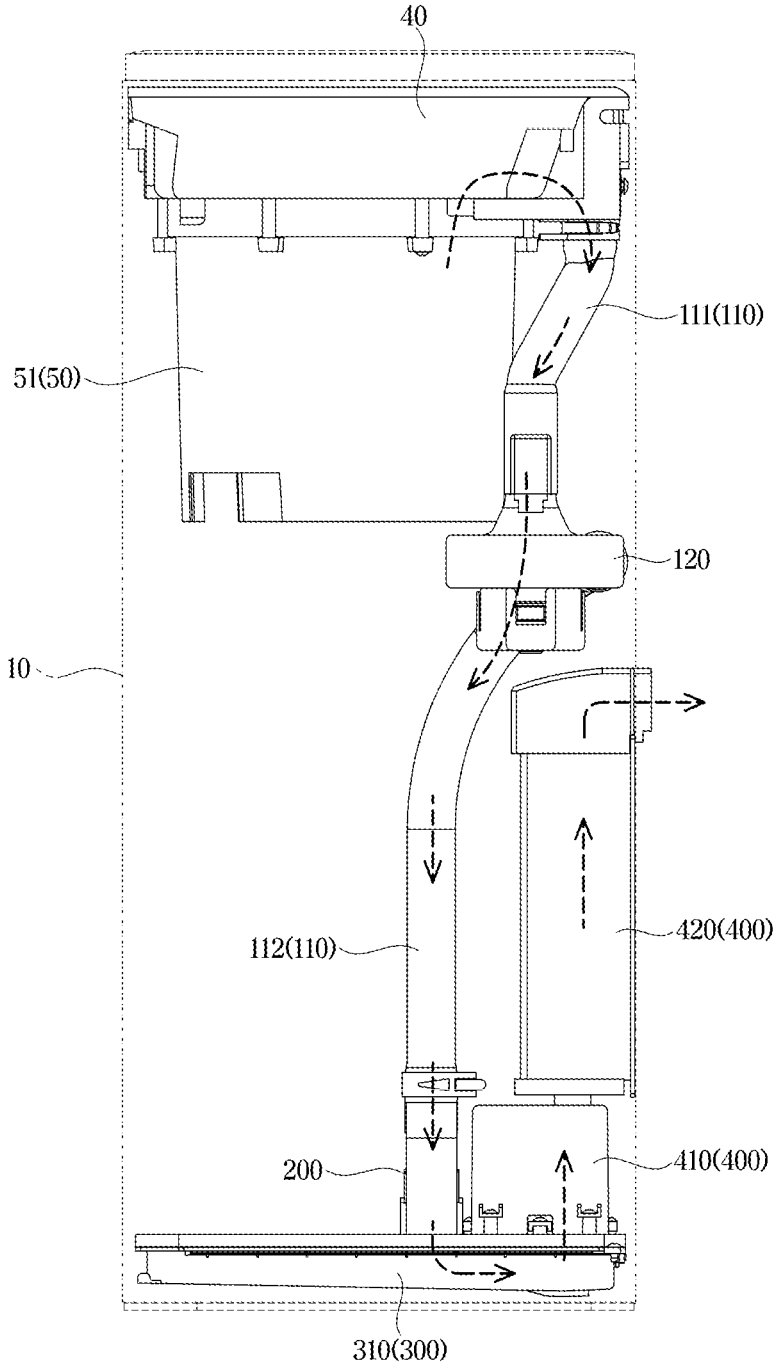
FIG. 5



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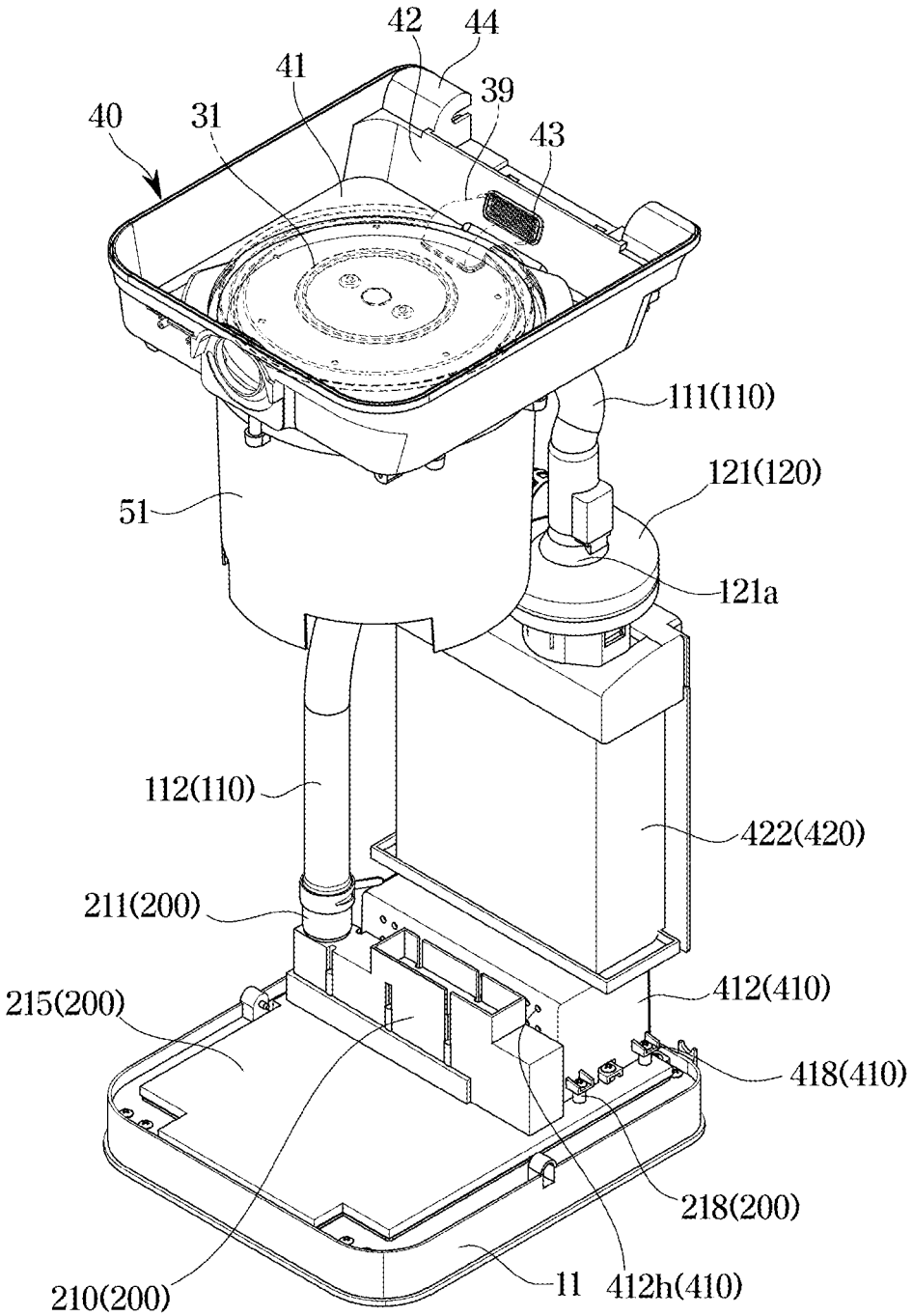
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FIG. 7

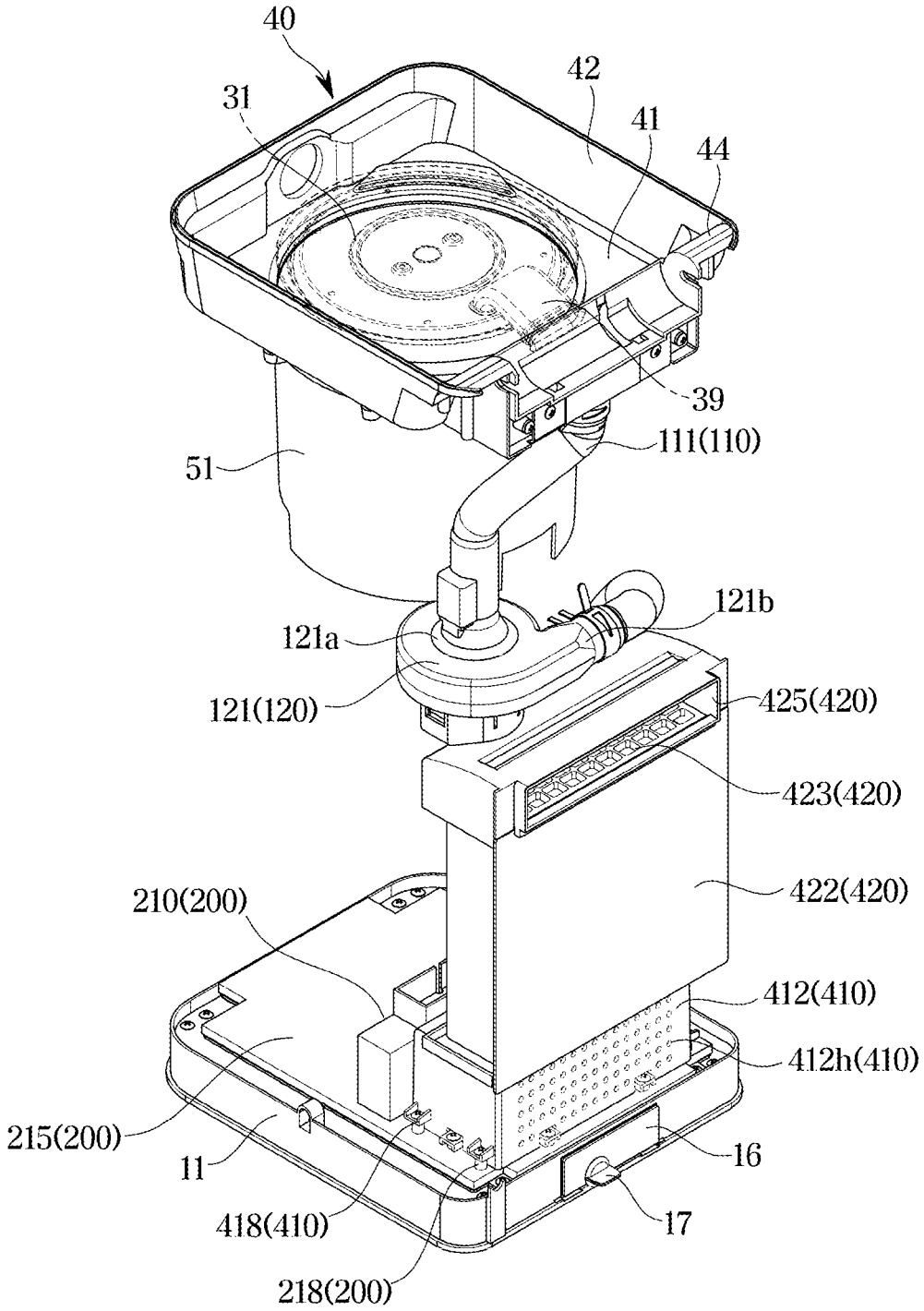
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FIG. 8

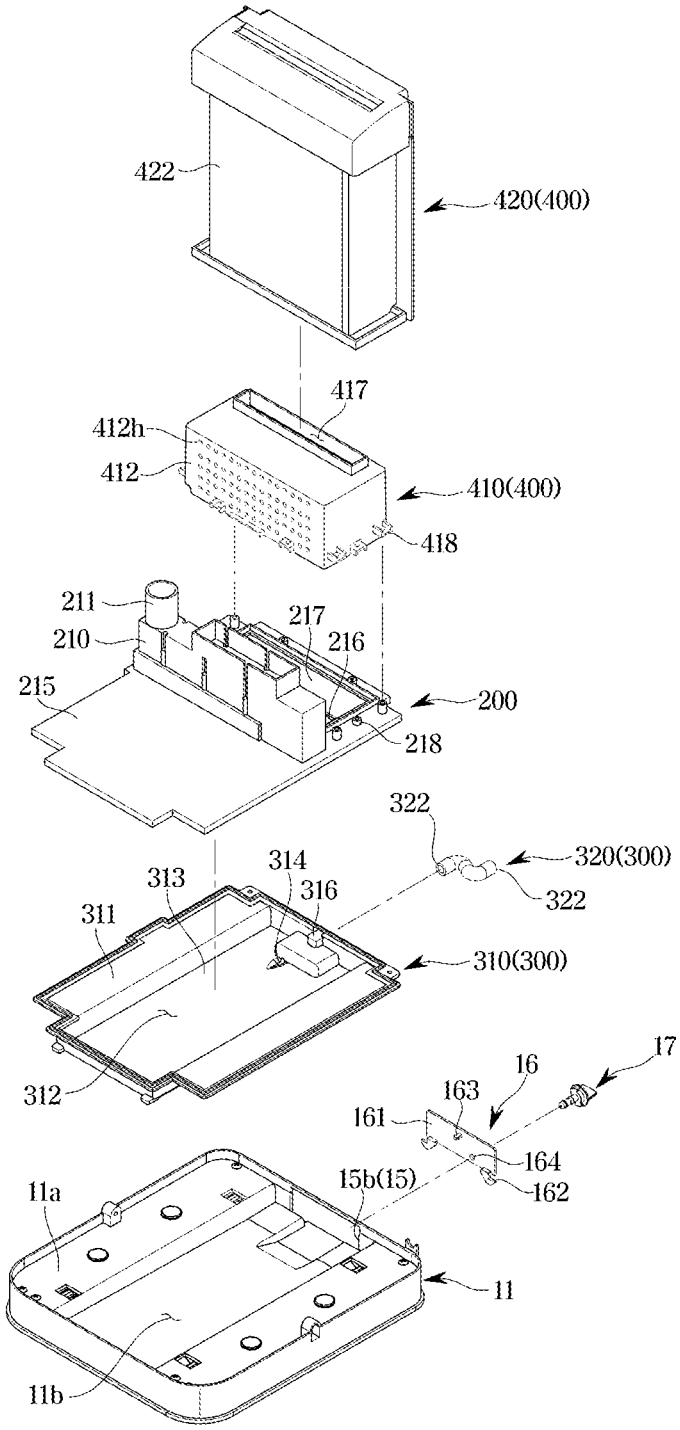
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FIG. 9

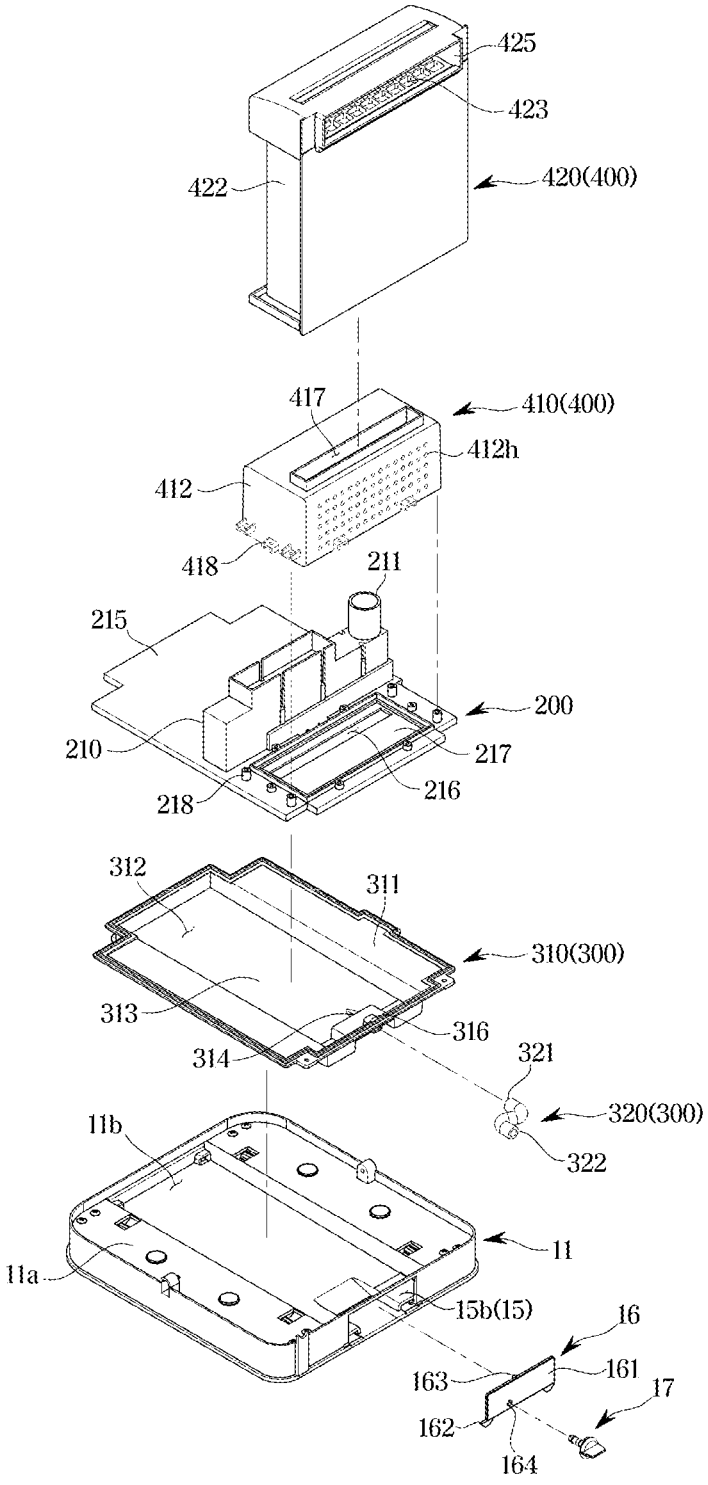
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FIG. 10

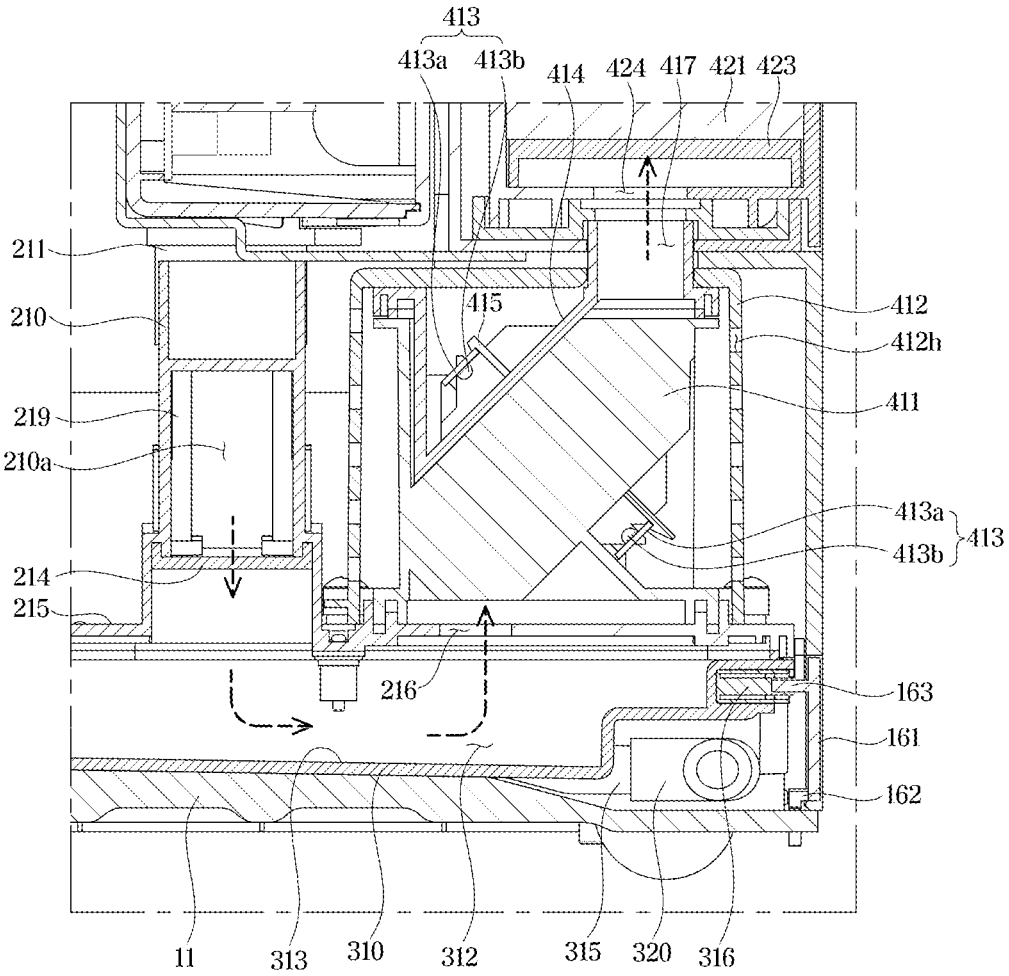
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FIG. 11

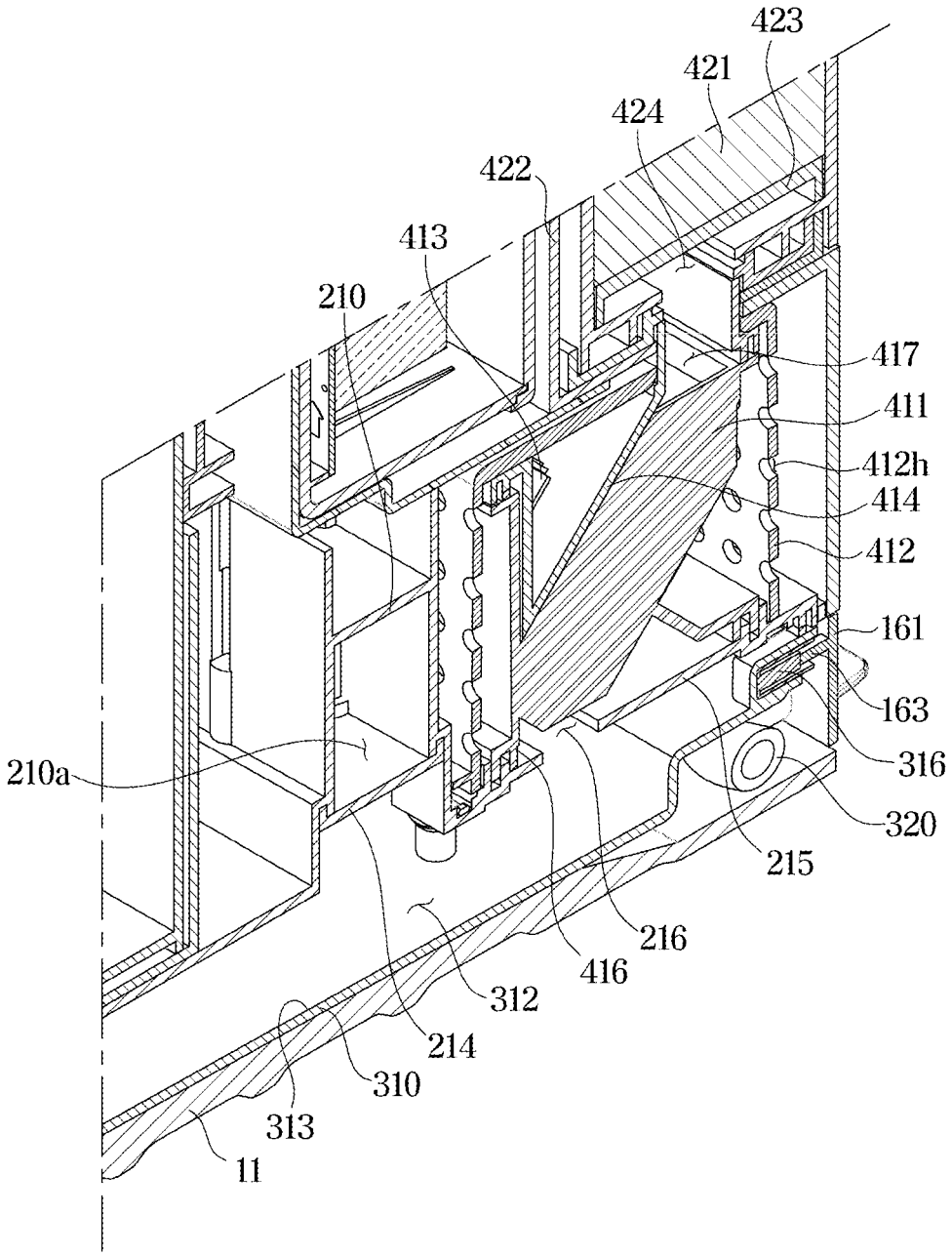
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FIG. 12

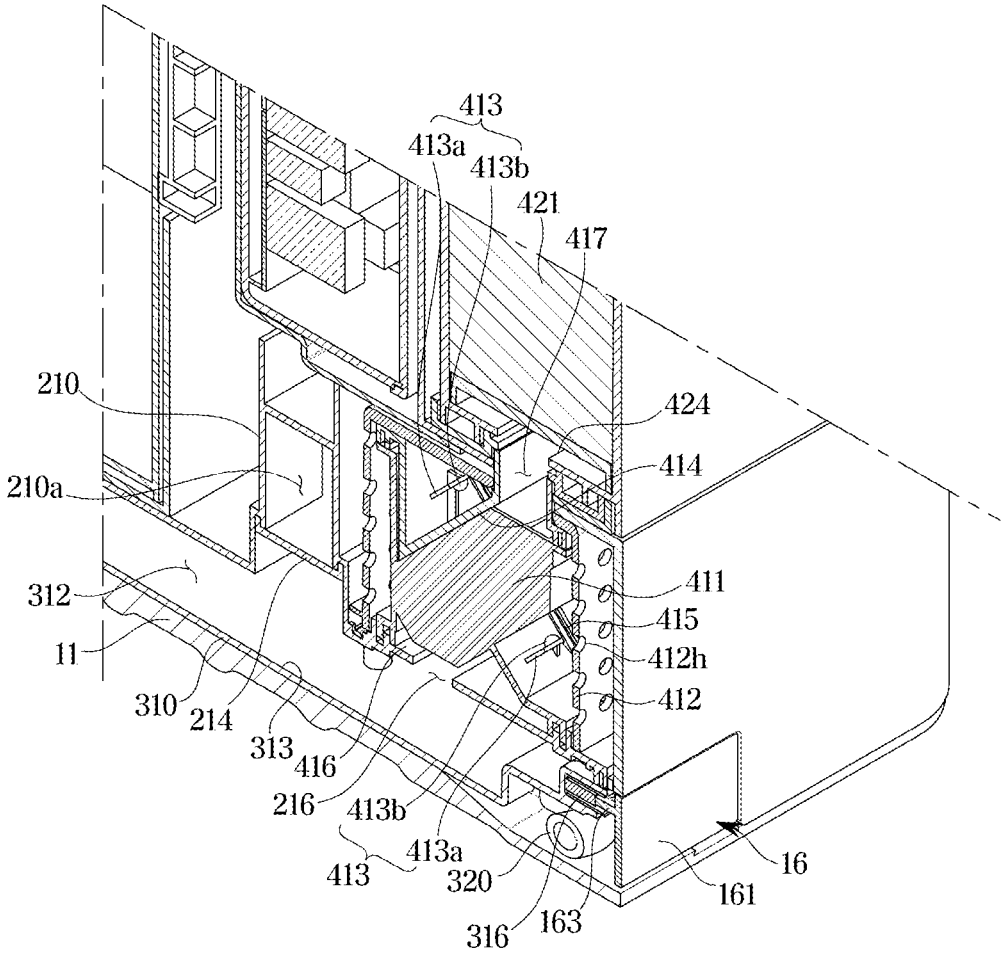
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FIG. 13

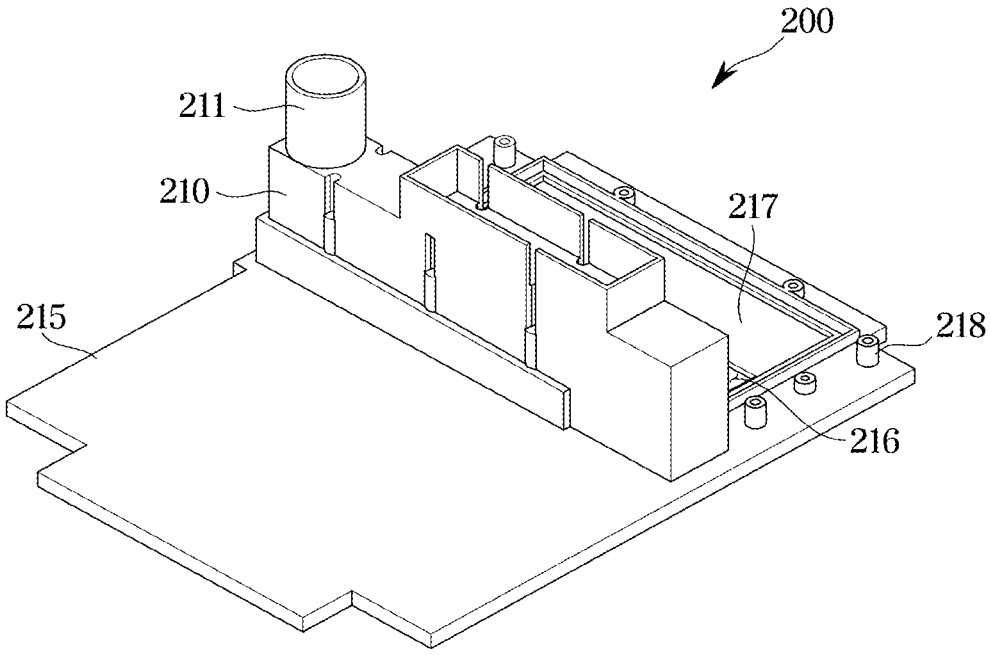
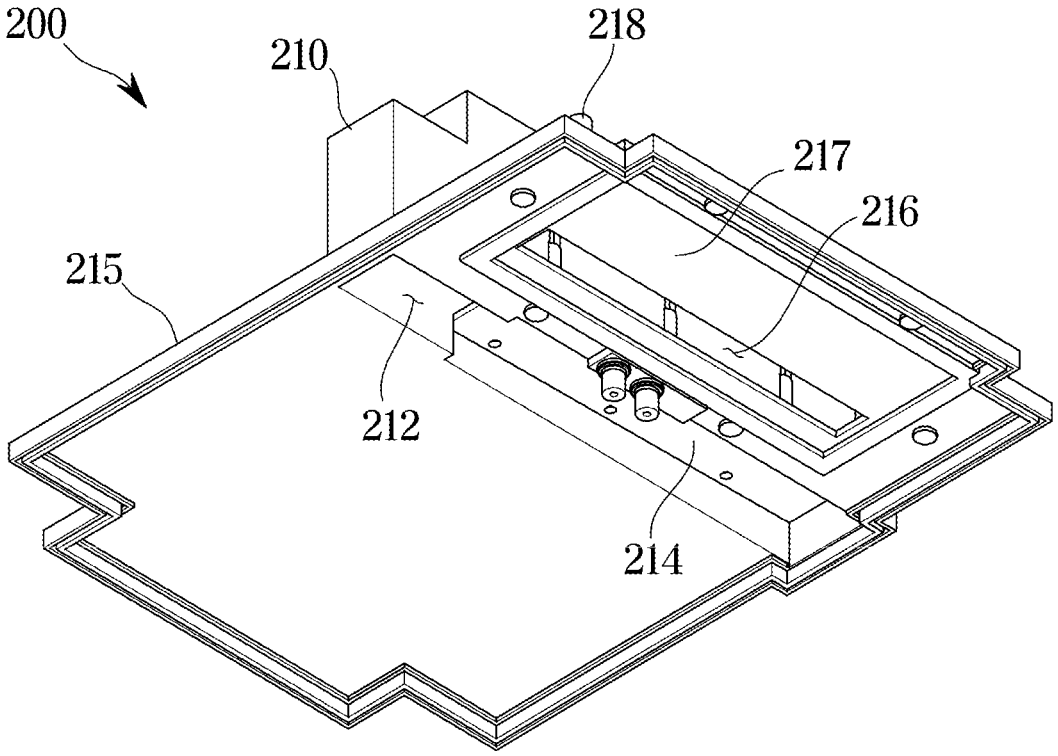


FIG. 14



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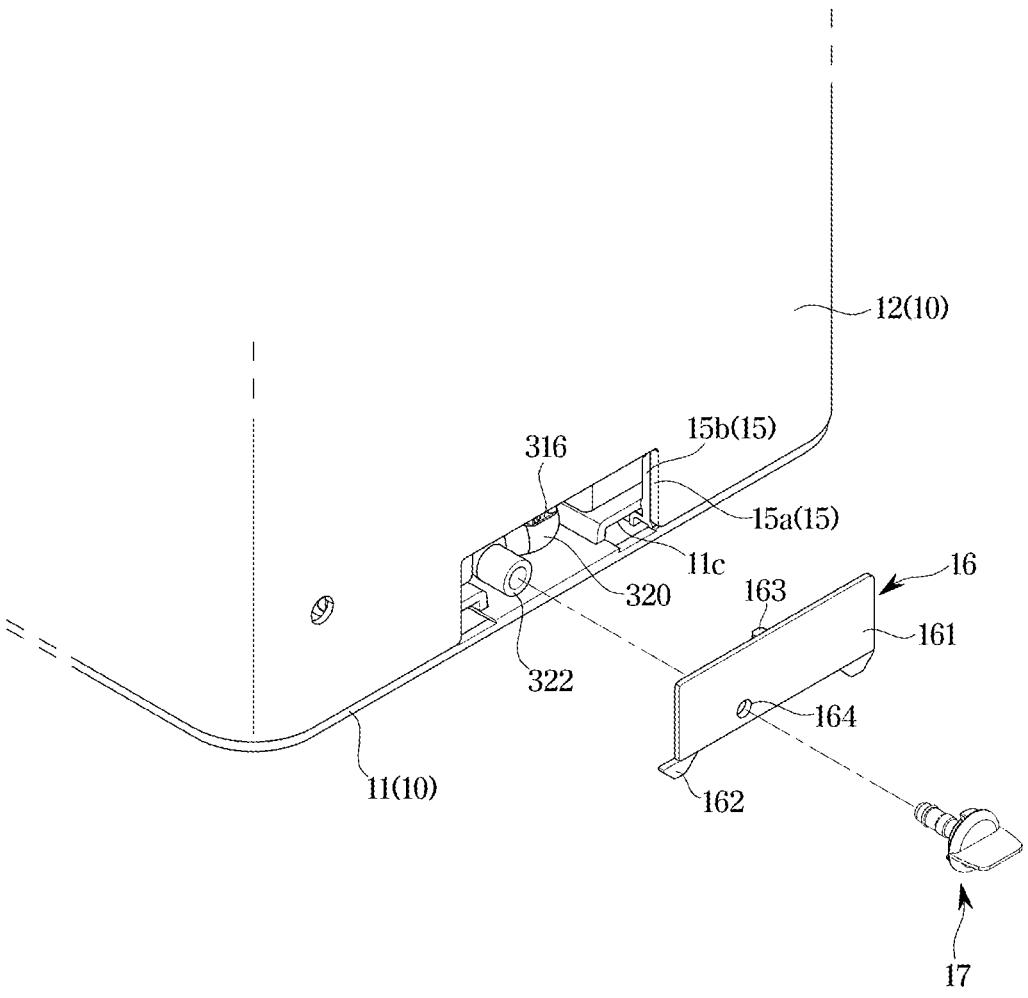

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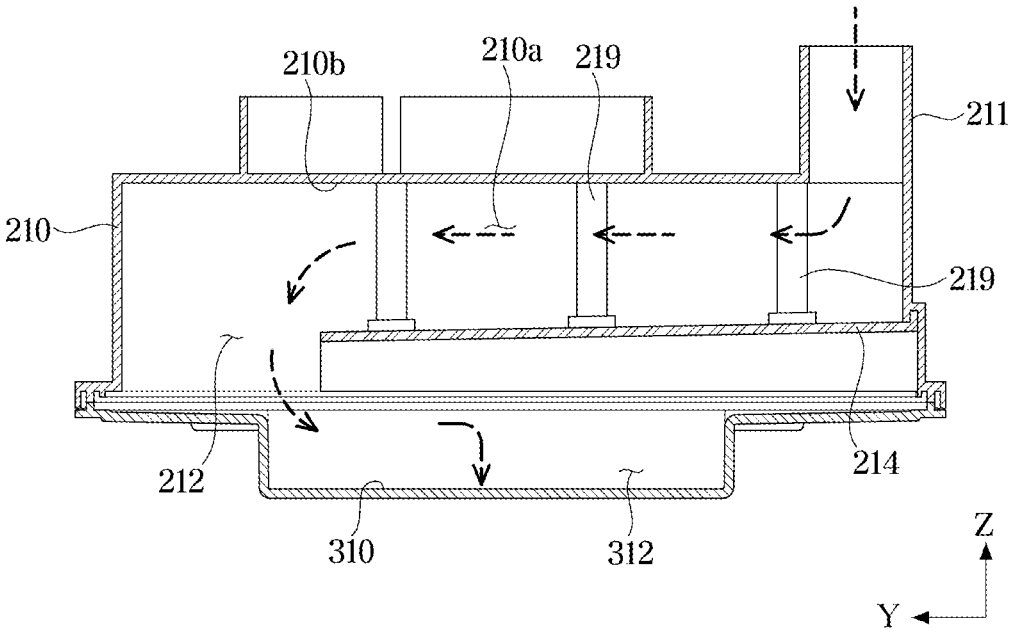

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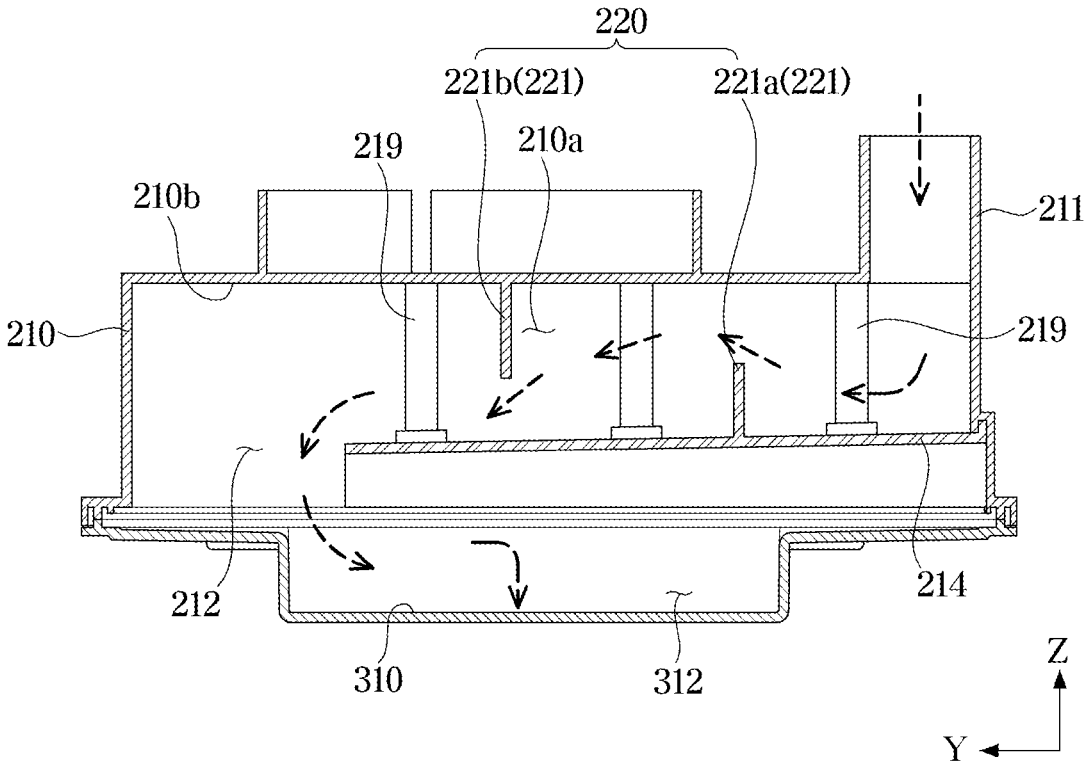
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FIG. 18

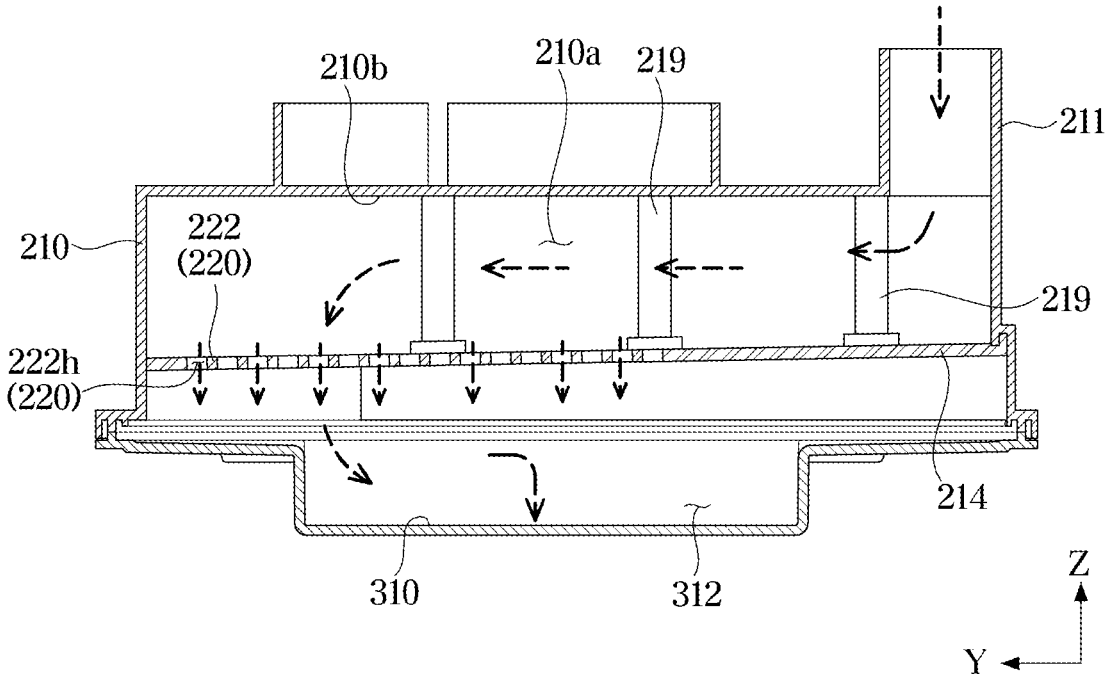
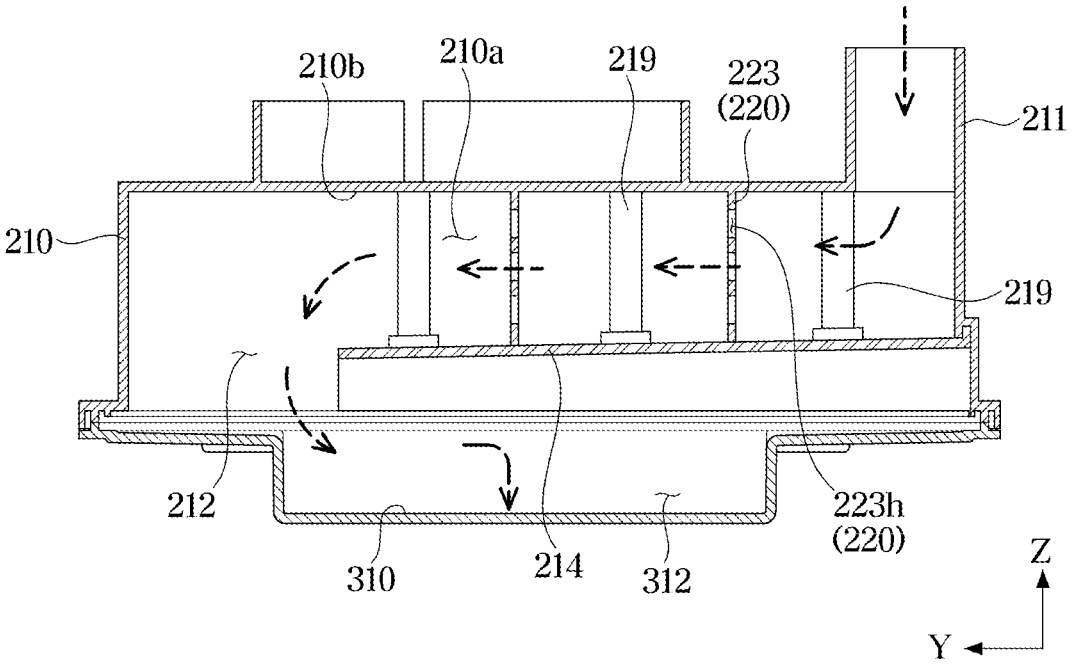


FIG. 19



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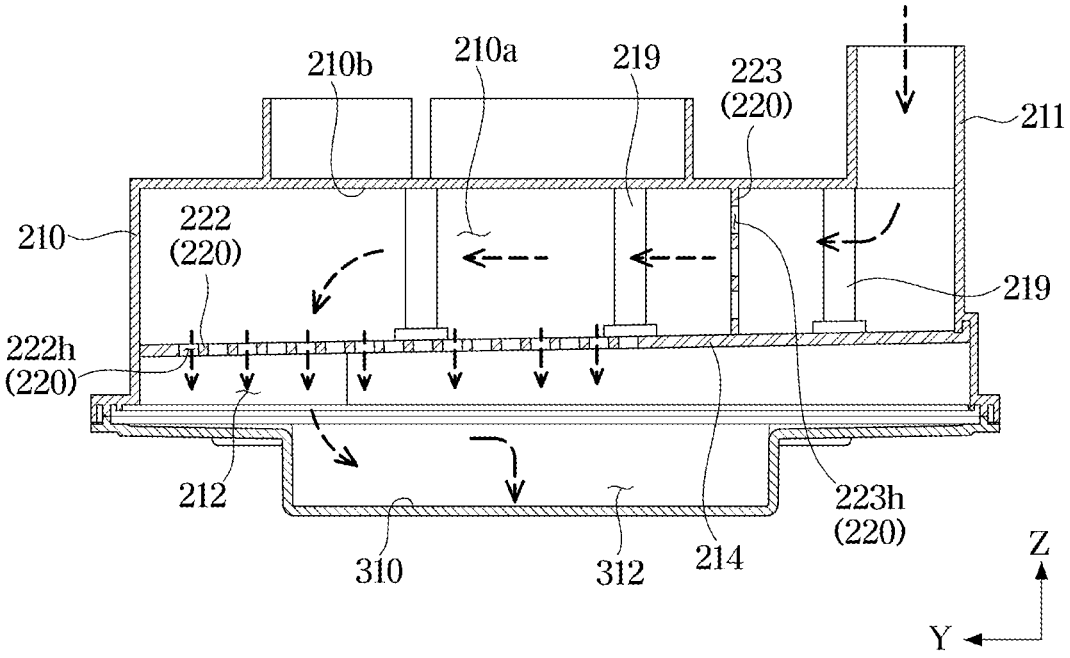
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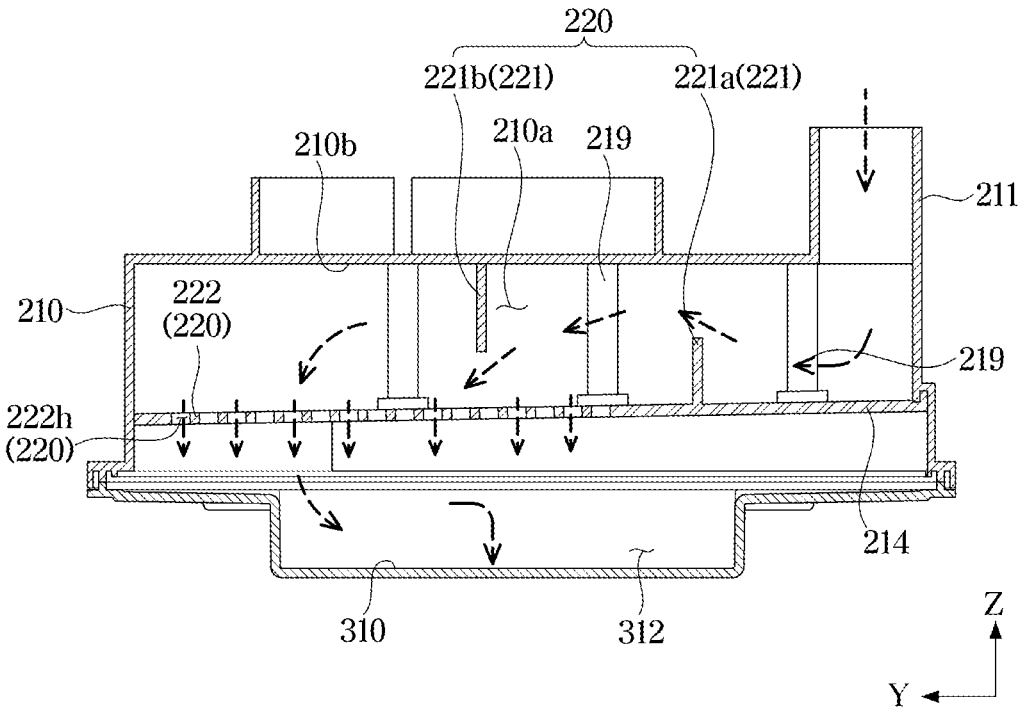
FIG. 21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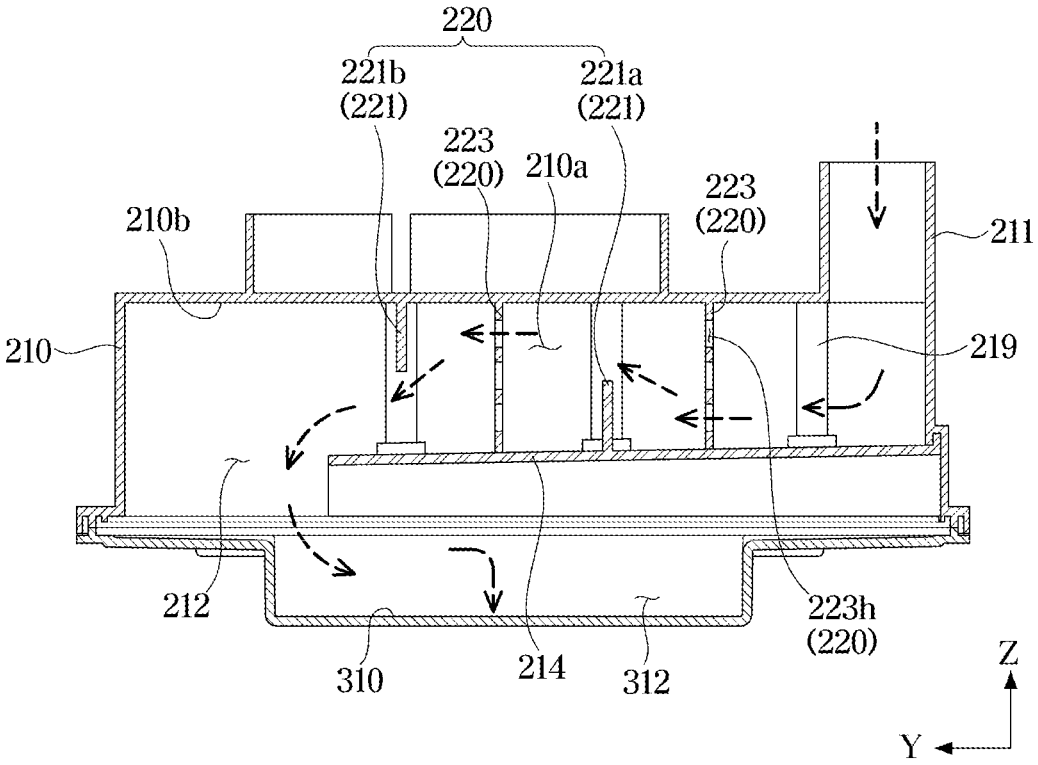
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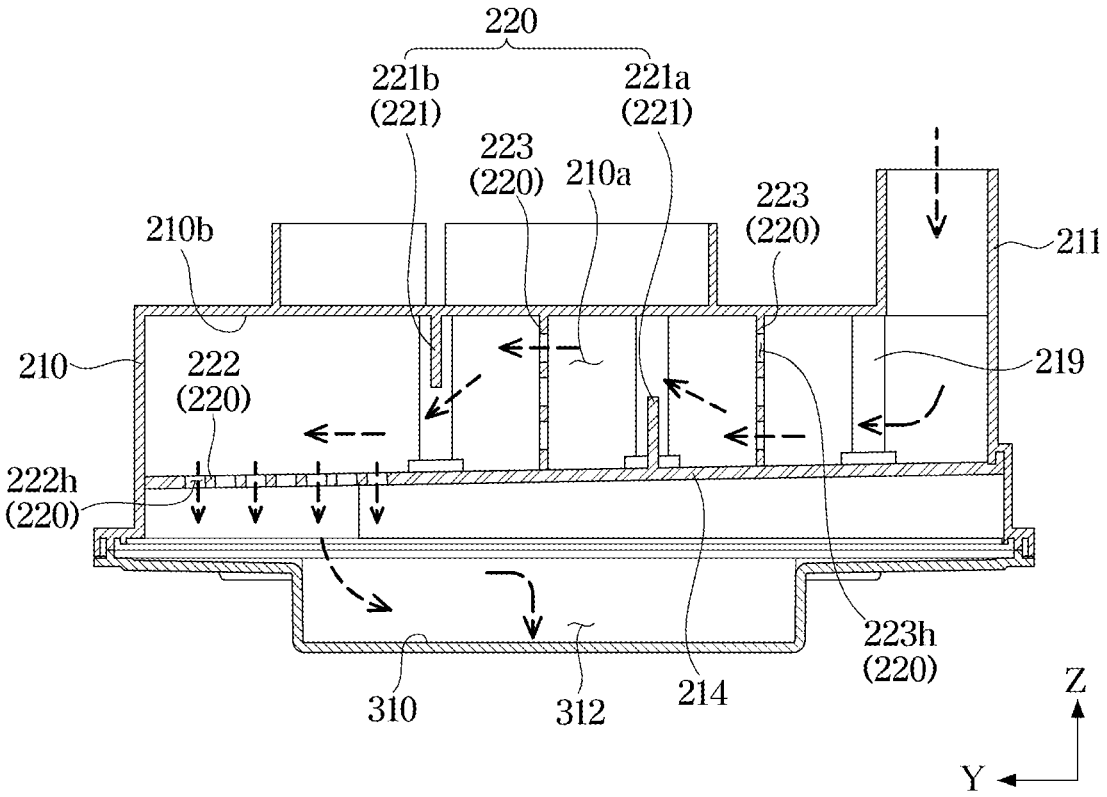
FIG. 23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FOOD WASTE DISPOSER

CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation application, under 35 U.S.C. § 111(a), of international application No. PCT/KR2022/010980, filed on Jul. 26, 2022, which claims priority under 35 U.S.C. § 119(e) to Korean Provisional Application No. 10-2021-0143780, filed on Oct. 26, 2021, and under 35 U.S.C. § 119 to Korean Patent Application No. 10-2021-0182618 filed on Dec. 20, 2021, the disclosures of which are incorporated herein by reference in its entirety.

BACKGROUND

1. Field

The disclosure relates to a food waste disposer having an improved structure.

2. Description of the Related Art

In general, a food waste disposer is an apparatus for disposing of food waste by drying, grinding, microbial fermentation, or the like.

As an example, the food waste disposer may include a grinding device for stirring and grinding food waste. The food waste disposer may include a heat generating device that applies heat to the grinding device such that the food waste inside the grinding device is dried.

As an example, the food waste disposer may include a filter device for filtering exhaust gas generated during disposal of food waste. The filter device may include a deodorizing filter to remove or neutralize the odor of the exhaust gas. However, since the deodorizing filter becomes saturated when adsorbing odors, periodic replacement is required. Accordingly, the food waste disposer may further include a catalytic filter to use the deodorizing filter for a longer period of time and to filter the exhaust gas more effectively. However, when the moisture content of the exhaust gas is high, the performance of the catalytic filter may become lowered.

SUMMARY

Therefore, it is an object of the disclosure to provide a food waste disposer with improved ease of use.

It is another object of the disclosure to provide a food waste disposer that prevents deterioration of the performance of a filter device by removing moisture from exhaust gas flowing into a catalytic filter.

It is another object of the disclosure to provide a food waste disposer capable of reducing a flow loss of exhaust gas during removal of moisture from the exhaust gas.

It is another object of the disclosure to provide a food waste disposer capable of effectively draining condensed water.

The technical objectives of the disclosure are not limited to the above, and other objectives may become apparent to those of ordinary skill in the art based on the following descriptions.

According to an aspect of the disclosure, there is provided a food waste disposer including: a housing; a container disposed inside the housing to accommodate food waste; an exhaust duct communicating with the container to allow exhaust gas generated in the container to flow therein; a filter device including a catalytic filter part configured to filter the exhaust gas passed through the exhaust duct, and a deodorizing filter part configured to filter the exhaust gas passed through the catalytic filter part and communicating with an outside of the housing; and a condensation chamber configured to remove moisture in the exhaust gas flowing from the exhaust duct into the catalytic filter part of the filter device, the condensation chamber including a condensation passage formed by extending in one direction to allow the exhaust gas to flow therethrough and a baffle plate provided in the condensation passage to obstruct a flow of the exhaust gas.

The baffle plate of the condensation chamber may include a plurality of through holes which the exhaust gas passes through.

The food waste disposer may further include a drain tray disposed at a lower side of the condensation chamber in the housing to collect condensed water generated in the condensation chamber.

The baffle plate may extend along the condensation passage, and the plurality of through holes may be arranged along the condensation passage.

The one direction may be a first direction, and the baffle plate may be disposed in a second direction crossing the first direction to block the condensation passage.

The baffle plate may include a plurality of baffle plates, and the plurality of baffle plates may be spaced apart from each other.

The condensation chamber may include: a chamber body forming the condensation passage therein; an inlet provided at one side of the chamber body, and communicating with the exhaust duct to introduce the exhaust gas from the exhaust duct into the condensation passage; and an outlet provided at an other side of the chamber body, and communicating with the drain tray to discharge the exhaust gas passed through the condensation passage to the drain tray.

The inlet may be formed in an upper portion of the chamber body, and the outlet is formed in a lower portion of the chamber body.

The drain tray may communicate with each of the condensation chamber and the catalyst filter part, and the exhaust gas passed through the condensation chamber may flow to the catalytic filter part through the drain tray.

The drain tray may further include: a drain hole through which the condensed water collected from the condensation chamber is drained; and a bottom surface part configured to form a recess for accommodating the condensed water collected from the condensation chamber, and provided to be inclined downward toward the drain hole.

The drain tray may comprise a drain hole formed therein, and the food waste disposer further comprises a drain pipe connected to the drain hole to discharge the condensed water drained from the drain hole to the outside of the housing.

The food waste disposer may further include an exhaust fan to communicate with the exhaust duct to form an intake airflow from the container toward the filter device.

The catalytic filter part may include: a filter case to accommodate a catalytic filter therein, and a light emitting member provided in the filter case to face the catalytic filter and to irradiate the catalytic filter when the catalytic filter is in accommodated in the filter case.

The filter case may include a case hole formed through the filter case to lower a temperature of the filter case by releasing heat generated by the light emitting member through the case hole.

The condensation chamber may further include a reinforcing member provided on an inner wall of the chamber body to reinforce a rigidity of the chamber body.

According to an aspect of the disclosure, there is provided a food waste disposer including: a housing; a grinding device including a grinding case having a upper portion that is open to receive food waste therethrough and a rotating grinder detachably mounted to an inside of the grinding case to grind the received food waste; a support frame configured to support an upper portion of the grinding device inside the housing; a cover rotatably coupled to one side of the support frame to open or close the grinding case; an exhaust duct configured to, in response to closing the grinding case by the cover, to communicate with the grinding case to allow exhaust gas generated in the griding case to flow therein; a condensation chamber configured to heat-exchange with the exhaust gas introduced from the exhaust duct, the condensation chamber including a baffle plate including a plurality of through holes to reduce a flow loss of the exhaust gas; a drain tray disposed at a lower side of the condensation chamber to accommodate condensed water generated from the condensation chamber; and a filter device configured to filter the exhaust gas having moisture removed through the heat exchange in the condensation chamber and discharge the filtered exhaust gas to an outside of the housing.

The filter device includes a photocatalytic filter configured to filter the exhaust gas passed through the condensation chamber and a deodorizing filter configured to filter the exhaust gas passed through the photocatalytic filter and communicating with the outside of the housing.

The condensation chamber may include a condensation passage formed therein, and through which the exhaust gas flows, and the baffle plate may be provided to divide the condensation passage from the drain tray.

The condensation chamber may include a condensation passage formed therein, and through which the exhaust gas flows, and the baffle plate may be provided to partition at least a portion of the condensation passage.

The food waste disposer may further include a service opening formed in a rear side of the housing corresponding to the drain tray such that the drain tray is accessible from the outside of the housing, and a service cover detachably mounted on the rear side of the housing to cover the service opening.

BRIEF DESCRIPTION OF THE DRAWINGS

These and/or other aspects of the disclosure will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings of which:

FIG. **1** is a perspective view illustrating a food waste disposer according to an embodiment;

FIG. **2** is a rear perspective view illustrating a food waste disposer according to an embodiment;

FIG. **3** is a perspective view illustrating a state in which a cover of a food waste disposer according to an embodiment is opened;

FIG. **4** is a cross-sectional view illustrating a food waste disposer according to an embodiment;

FIG. **5** is a schematic diagram illustrating a deodorizing structure of a food waste disposer according to an embodiment;

FIG. **6** is a schematic perspective view illustrating a deodorizing structure of a food waste disposer according to an embodiment;

FIG. **7** is a schematic rear perspective view illustrating a deodorizing structure of a food waste disposer according to an embodiment;

FIG. **8** is an exploded view illustrating a filter device, a condensation chamber, a drainage device, and a base frame of a food waste disposer according to an embodiment;

FIG. **9** is a rear view illustrating a filter device, a condensation chamber, a drainage device, and a base frame of a food waste disposer according to an embodiment;

FIG. **10** is an enlarged view of portion A shown in FIG. **4**;

FIG. **11** is a view illustrating a portion of a food waste disposer according to an embodiment;

FIG. **12** is a view illustrating the portion of the food waste disposer shown in FIG. **11** in a different direction;

FIG. **13** is a perspective view illustrating a condensation chamber of a food waste disposer according to an embodiment;

FIG. **14** is a bottom perspective view illustrating a condensation chamber of a food waste disposer according to an embodiment;

FIG. **15** is an exploded view illustrating a rear portion of a food waste disposer according to an embodiment;

FIG. **16** is a cross-sectional view of a condensation chamber and a drain tray of a food waste disposer according to an embodiment;

FIG. **17** is a cross-sectional view of a condensation chamber and a drain tray of a food waste disposer according to an embodiment;

FIG. **18** is a cross-sectional view of a condensation chamber and a drain tray of a food waste disposer according to an embodiment;

FIG. **19** is a cross-sectional view of a condensation chamber and a drain tray of a food waste disposer according to an embodiment;

FIG. **20** is a cross-sectional view of a condensation chamber and a drain tray of a food waste disposer according to an embodiment;

FIG. **21** is a cross-sectional view of a condensation chamber and a drain tray of a food waste disposer according to an embodiment;

FIG. **22** is a cross-sectional view of a condensation chamber and a drain tray of a food waste disposer according to an embodiment; and

FIG. **23** is a cross-sectional view of a condensation chamber and a drain tray of a food waste disposer according to an embodiment.

DETAILED DESCRIPTION

Embodiments described in the specification and configurations shown in the accompanying drawings are merely examples of the present disclosure, and various modifications may replace the embodiments and the drawings of the present disclosure at the time of filing of the present application.

Further, identical symbols or numbers in the drawings of the present disclosure denote components or elements configured to perform substantially identical functions.

Further, terms used herein are only for the purpose of describing particular embodiments and are not intended to limit to the present disclosure. The singular form is intended to include the plural form as well, unless the context clearly indicates otherwise. It should be further understood that the terms "include," "including," "have," and/or "having" specify the presence of stated features, integers, steps, operations, elements, components, and/or groups thereof, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

It will be understood that when an element is referred to as being "connected," or "coupled," to another element, it may be directly connected or coupled to the other element or intervening elements may be present. In contrast, when an element is referred to as being "directly connected," or "directly coupled," to another element, there are no intervening elements present.

Further, when it is stated that a member is "on" another member, the member may be directly on another member or a third member may be disposed therebetween.

Further, it should be understood that, although the terms "first," "second," etc. may be used herein to describe various elements, the elements are not limited by the terms, and the terms are only used to distinguish one element from another. For example, a first element could be termed a second element, and similarly, a second element could be termed a first element without departing from the scope of the present disclosure. The term "and/or" includes combinations of one or all of a plurality of associated listed items.

Meanwhile, the terms "front and rear directions", "front side", "rear side", "upper portion", "lower portion", "upper side", "lower side", etc. used in the following description are defined based on the drawings, and by the terms may not restrict the shape and position of each component. For example, a direction of air discharged from a discharge port (an outlet) **17** to be described below may be defined as a front, and a direction opposite to the front may be defined as a rear. Specifically, a direction toward which an inlet **15** faces may be referred to as a rear, and a direction opposite to the rear may be referred to as a front.

For example, as shown in FIGS. **1** to **4**, a direction in which a storage case **82** faces in a food waste disposer **1** may be defined as a forward direction (+X direction), and a direction opposite to the forward direction may be defined as a backward direction (−X direction) in the food waste disposer **1**. In addition, for example, the X direction may be referred to as a front-rear direction, the Y direction may be referred to as a left-right direction, and the Z direction may be referred to as a vertical direction. However, this is only referred to with reference to the drawings for the sake of convenience of description, and the disclosure is not limited thereto.

Hereinafter, an embodiment according to the disclosure will be described in detail with reference to the accompanying drawings.

FIG. **1** is a perspective view illustrating a food waste disposer according to an embodiment. FIG. **2** is a rear perspective view illustrating a food waste disposer according to an embodiment.

Referring to FIGS. **1** and **2**, a food waste disposer **1** may include a housing **10** and a cover **30** covering an upper portion of the housing **10**.

The housing **10** may form the external appearance of the food waste disposer **1**. For example, the housing **10** may include a base frame **11** and a side frame **12** disposed on an upper side of the base frame **11**. The base frame **11** and the side frame **12** may be detachably coupled to each other.

In the drawings, the side frame **12** is illustrated as an integral body, but is not limited thereto. The side frame **12** may be provided as a plurality of frames that may be coupled to each other. In this case, various parts disposed inside the food waste disposer **1** may be accessed by separating the plurality of frames.

For example, the base frame **11** may form a bottom surface of the food waste disposer **1**, and the side frame **12** may form a side surface of the food waste disposer **1**. For example, the side frame **12** may include four sidewalls. However, the disclosure is not limited thereto, and the side frame **12** may be provided in various shapes as long as it can cover various parts provided inside the housing **10**.

The food waste disposer **1** may include an accommodating part **13** that is formed inside the housing **10** by the front of the housing **10** being opened.

The accommodating part **13** may be provided to accommodate a storage case **82** to be described below. The storage case **82** may be provided to be inserted into and withdrawn from the accommodating part **13**. For example, the storage case **82** may be withdrawn from or inserted into the accommodating part **13** by sliding along the front-rear direction.

The storage case **82** may have a front surface **82***a* on which a grip part **83** provided to be gripped is disposed. For example, the grip part **83** may have a shape that is recessed backward from the front surface **82***a* of the storage case **82**.

Although not shown in the drawing, the storage case **82** may be provided with a window on the front surface **82***a* thereof such that the amount of food waste inside the storage case **82** may be visually checked.

The food waste disposer **1** may include an exhaust hole **14** provided at the rear side of the housing **10**. The exhaust hole **14** may be provided to communicate with a discharge part **425** of the filter device **400** to be described below. The exhaust hole **14** may be opened to the rear side of the housing **10** such that the discharge part **425** of the filter device **400** to be described below communicates with the outside of the housing **10**. The filter device **400** may filter exhaust gas and discharge the filtered exhaust gas to the outside of the housing **10**. In this case, the filtered gas may be discharged to the outside of the housing **10** through the exhaust hole **14**.

FIG. **3** is a perspective view illustrating a state in which a cover of a food waste disposer according to an embodiment is opened. FIG. **4** is a cross-sectional view illustrating a food waste disposer according to an embodiment.

The food waste disposer **1** may include a support frame **40**.

The support frame **40** may be provided to support a container **50** inside the housing **10**. The support frame **40** may support an upper portion of the container **50**. The support frame **40** may support the outer peripheral surface of the container **50** such that the container **50** is stably supported inside the housing **10**.

The support frame **40** may include a hinge coupling part **44** provided to be coupled to a hinge **20**.

The support frame **40** may include a base part **41** and an extension part **42**.

The base part **41** may form an upper surface of the support frame **40**. The extension part **42** may extend from the base part **41**. The extension part **42** may extend upward to correspond to the side frame **12**. For example, the hinge coupling part **44** may be formed on one side of the extension part **42** adjacent to the hinge **20**.

The base part **41** may include an insertion hole **46** into which the container **50** may be inserted. The container **50** may be inserted into the insertion hole **46** and supported by the support frame **40**.

The support frame **40** may include a suction part **43**. For example, the suction part **43** may include a plurality of suction holes. The suction part **43** may be provided to communicate with the container **50**. For example, when the cover **30** closes the housing **10**, the suction part **43** may be provided to communicate with the container **50** through the cover **30**. While the cover **30** closes the housing **10**, the exhaust gas in the container **50** flows into the cover **30**, and the exhaust gas flowing into the cover **30** is sucked into the

suction part **43** by a guide duct **39** to be described below. Detailed descriptions thereof will be provided below.

The support frame **40** may include a connection passage **45**. The connection passage **45** may form a portion of a passage through which the exhaust gas flows. For example, the connection passage **45** may connect the guide duct **39** to an exhaust duct **110** to be described below. The connection passage **45** may connect the guide duct **39** to a first duct part **111** of the exhaust duct **110** to be described below.

The food waste disposer **1** may include the container **50**.

The container **50** may be provided to accommodate food waste therein. The container **50** may be disposed inside the housing **10**.

The container **50** may include an inlet **54** having an open top. The user may put food waste into the container **50** through the inlet **54** of the container **50**. A container cover part **31** of the cover **30** may cover the inlet **54**. The container cover part **31** may have a size corresponding to that of the inlet **54**.

The container **50** may be provided to dispose of food waste. For example, the container **50** may process food waste through at least one of drying, grinding, or microbial fermentation.

Hereinafter, for the sake of convenience of description, the container **50** will be illustrated a grinding device **50** provided to grind food waste as an example. However, this is only an example, and the container **50** may be provided to dispose of food waste in various ways.

The grinding device **50** may include a grinding case **51** in which food waste is accommodated and grinded.

The grinding case **51** may include an inlet **54** having an open top. Food waste may be introduced into the grinding case **51** through the inlet **54**.

The grinding case **51** may include an outlet **53** that is opened such that the grinded food waste is transferred to a storage device **80** to be described below.

The grinding device **50** may include a grinder **52** provided inside the grinding case **51**. The grinder **52** may be provided to grind the food waste put into the grinding case **51**. For example, the grinder **52** may include a plurality of blades.

The grinder **52** may be detachably mounted inside the grinding case **51**. The grinder **52** may be rotatably provided inside the grinding case **51**. The grinder **52** may be rotatably mounted on the bottom surface of the grinding case **51**.

The cover **30** may be rotatably coupled to one side of the support frame **40** to open and close the inlet **54** of the grinding case **51**.

The food waste disposer **1** may include a heat generating device **60**.

The heat generating device **60** may be disposed to heat the grinding device **50** at a lower side of the grinding device **50**. The heat generating device **60** may be disposed at a lower side of the grinding case **51** of the grinding device **50**. For example, the heating device **60** may have a heating wire accommodated therein.

The food waste disposer **1** may include a driving device **70**.

The driving device **70** may be disposed at a lower side of the grinding device **50** and the heat generating device **60**. The driving device **70** may be provided to transmit power to the grinding device **50**. The driving device **70** may transmit power to the grinder **52**. The driving device **70** may transmit power to a valve assembly **90** to be described below.

The food waste disposer **1** may include the valve assembly **90**.

The valve assembly **90** may be provided to open and close the outlet **53** of the grinding device **50** by rotating. When the valve assembly **90** opens the outlet **53**, the grinded food waste inside the grinding case **51** may be transferred to the storage case **82** of the storage device **80** through a transfer duct **81**. When the valve assembly **90** closes the outlet **53**, the grinded food waste inside the grinding case **51** may not flow into the transfer duct **81**.

The valve assembly **90** may receive power from the driving device **70**.

The food waste disposer **1** may include the storage device **80**.

The storage device **80** may include the storage case **82** and the transfer duct **81**.

The transfer duct **81** may transfer food waste introduced from the grinding device **50** to the storage case **82**. The transfer duct **81** may transfer the food waste grinded and dried in the grinding device **50** to the storage case **82**. The transfer duct **81** may include a shape extending in the vertical direction (the Z direction).

The storage case **82** may be provided to accommodate the food waste transferred from the grinding device **50**. The storage case **82** may be provided to receive and store the food waste grinded and dried by the grinding device **50**.

The storage case **82** may be accommodated in the accommodating part **13**. The storage case **82** may be provided in a way to be withdrawn from or inserted into the accommodating part **13**. The storage case **82** may be slidable in the front-rear direction (the X direction). The storage case **82** may be detachably coupled to the housing **10**. The storage case **82** may include the grip part **83** provided on the front surface **82***a* to be gripped. For example, the user may grip the grip part **83** to withdraw the storage case **82** from the accommodating part **13** or insert the storage case **82** into the accommodating part **13**.

The cover **30** may be provided to open and close the upper portion of the housing **10**. The cover **30** may be provided to be rotated with respect to the housing **10** through the hinge **20**.

The cover **30** may include a container cover part **31** and a top plate **32**.

The container cover part **31** may be provided to cover the container (the grinding device) **50**. The container cover part **31** may be provided to cover the upper portion of the grinding case **51** provided to accommodate and grind food waste. The container cover part **31** may be provided to cover the inlet **54**.

The top plate **32** may form an upper surface of the food waste disposer **1**.

The container cover part **31** may include a lower frame **33** provided to face the grinding case **51** when the housing **10** is closed by the cover **30**, and an upper frame **34** coupled to the upper side of the lower frame **33**. The lower frame **33** may be coupled to the upper frame **34** while forming a predetermined space **31***a* therebetween.

In the predetermined space **31***a* formed between the lower frame **33** and the upper frame **34**, a circulation fan **37** may be provided. The circulation fan **37** may allow the heat inside the grinding case **51** to be evenly spread. Through the circulation fan **37**, a convection phenomenon may occur inside the grinding case **51**. As a result, the internal temperature of the grinding case **51** may become uniform, and the drying efficiency may be improved.

A circulation fan driving part **38** may be provided to drive the circulation fan **37**. The circulation fan driving part **38** may be provided between the top plate **32** and the container cover part **31**.

The lower frame **33** may include a first communication hole **35**. The upper frame **34** may include a second communication hole **36**.

In order to guide the exhaust gas generated from the grinding case **51** to an exhaust duct **110** to be described below, a guide duct **39** may be provided. For example, the guide duct **39** may have one end connected to the container cover part **31**, and the other end connected to the suction part **43** of the support frame **40**. For example, the one end of the guide duct **39** may communicate with the upper frame **34** of the container cover part **31**, and the other end of the guide duct **39** may communicate with the connection passage **45** of the support frame **40**.

The guide duct **39** may be provided to interwork with the rotation of the cover **30**. For example, when the cover **30** closes the housing **10**, the one end of the guide duct **39** may be disposed to face the grinding case **51** in linkage with the container cover part **31** For example, when the cover **30** closes the housing **10**, the one end of the guide duct **39** may be provided to face downward.

For example, the guide duct **39** may be mounted inside the cover **30**. The one end of the guide duct **39** may be fixed to the upper frame **34**. The guide duct **39** may include a curved shape. However, the disclosure is not limited thereto, and the guide duct **39** may be provided in various positions and shapes as long as it can guide the exhaust gas in the grinding case **51** to the exhaust duct **110**.

The exhaust gas in the grinding case **51** may be introduced into the space **31***a* of the container cover part **31** through the first communication hole **35** of the lower frame **33**. The exhaust gas introduced into the space **31***a* of the container cover part **31** may be introduced into the one end of the guide duct **39** through the second communication hole **36** of the upper frame **34**. The exhaust gas introduced into the one end of the guide duct **39** may be introduced into the connection passage **45** through the suction part **43** of the support frame **40**. The exhaust gas flowing into the connection passage **45** may flow into the first duct part **111** of the exhaust duct **110**. However, the disclosure is not limited to the above-described example, and the exhaust gas in the grinding case **51** may be directly introduced into the first duct part **111** of the exhaust duct **110**.

FIG. **5** is a schematic diagram illustrating a deodorizing structure of a food waste disposer according to an embodiment. FIG. **6** is a schematic perspective view illustrating a deodorizing structure of a food waste disposer according to an embodiment. FIG. **7** is a schematic rear perspective view illustrating deodorizing structure of a food waste disposer according to an embodiment.

The food waste disposer **1** may include exhaust gas guide devices **110** and **120**.

The exhaust gas guide device may include an exhaust duct **110**.

The exhaust gas guide device may include an exhaust fan assembly **120**.

The exhaust gas generated from the grinding device **50** may flow in the exhaust duct **110**. The exhaust duct **110** may form an exhaust passage through which exhaust gas flows.

For example, when the cover **30** closes the housing **10**, the exhaust duct **110** may be provided to accommodate the exhaust gas from the grinding device **50**. When the cover **30** covers the inlet **54**, the exhaust duct **110** may communicate with the grinding case **51** and accommodate exhaust gas from the grinding case **51**.

The exhaust duct **110** may be provided to communicate with the grinding device **50**. The exhaust duct **110** may be allowed to directly communicate with the grinding device **50**, or indirectly communicate with the grinding device **50** through separate components.

For example, exhaust gas generated from the grinding device **50** may flow, through the container cover part **31** of the cover **30**, the guide duct **39**, and the support frame **40**, into the exhaust duct **110**. However, the disclosure is not limited thereto, and the exhaust gas generated from the grinding device **50** may be introduced into the exhaust duct **110** without passing through some of the container cover part **31** of the cover **30**, the guide duct **39**, and the support frame **40**. Alternatively, the exhaust gas generated from the grinding device **50** may further pass through additional components other than the container cover part **31** of the cover **30**, the guide duct **39**, and the support frame **40** before flowing into the exhaust duct **110**.

The exhaust duct **110** may include a first duct part **111** and a second duct part **112**.

For example, the first duct part **111** may have one end connected to the connection passage **45** of the support frame **40**, and the other end connected to a first connection part **121***a* of the exhaust fan assembly **120**. For example, the second duct part **112** may have one end connected to a second connection part **121***b* of the exhaust fan assembly **120** and the other end connected to an inlet **211** of a condensation chamber **200** to be described below.

The exhaust fan assembly **120** may include an exhaust fan (not shown), an exhaust fan driving part (not shown) for driving the exhaust fan, and a fan case **121** accommodating the exhaust fan and the exhaust fan driving part.

The exhaust fan may communicate with the exhaust duct **110** such that the exhaust gas forms an intake airflow from the grinding device **50** toward the filter device **400**. The exhaust fan may be provided on an exhaust passage formed by the exhaust duct **110**. The exhaust gas may be allowed to flow more smoothly in the exhaust duct **110** by the exhaust fan.

The fan case **121** may include the first connection part **121***a* and the second connection part **121***b*. The first connection part **121***a* may be connected to the first duct part **111**, and the second connection part **121***b* may be connected to the second duct part **112**. For example, the first connection part **121***a* may be provided on the upper side of the fan case **121**, and the second connection part **121***b* may be provided on the lateral side of the fan case **121**.

The exhaust fan may be disposed such that the suction side thereof faces the first duct part **111** and the discharge side thereof faces the second duct part **112**. The suction side of the exhaust fan may correspond to the first connection part **121***a*, and the discharge side of the exhaust fan may correspond to the second connection part **121***b*.

The food waste disposer **1** may include a condensation chamber **200**.

The condensation chamber **200** may be provided to remove moisture in the exhaust gas introduced from the exhaust duct **110**. The condensation chamber **200** may be provided to remove moisture in the exhaust gas directed to the filter device **400**. The condensation chamber **200** may be provided to lower the moisture content of the exhaust gas before the exhaust gas flows into a catalytic filter part **410** of the filter device **400** to be described below. Details thereof will be described below.

The food waste disposer **1** may include a filter device **400**.

The filter device **400** may filter the exhaust gas generated from the grinding device **50** and discharge the filtered exhaust gas to the outside of the housing **10**. The filter device **400** may sterilize and/or deodorize the exhaust gas.

For example, the filter device **400** includes a catalytic filter part **410** provided to filter exhaust gas passed through the exhaust duct **110** and a deodorizing filter part **420** provided to filter exhaust gas passed through the catalytic filter part **410** and communicate with the outside of the outside. By the catalytic filter part **410** provided in the filter device **400**, the deodorizing performance of the deodorizing filter part **420** may be improved, and the life of the deodorizing filter part **420** may be extended.

The filter device **400** may be provided to accommodate the exhaust gas having moisture thereof reduced or removed by passing through the condensation chamber **200**.

In other words, exhaust gas passed through the exhaust duct **110** may be provided to be condensed by the condensation chamber **200** before being introduced into the filter device **400**. For example, exhaust gas passed through the exhaust duct **110** may flow into the condensation chamber **200** and then sequentially pass through the catalytic filter part **410** and the deodorizing filter part **420**. Accordingly, degradation of the performance of the catalytic filter part **410** due to moisture penetration may be prevented. In addition, since the replacement cycle of a deodorizing filter **421** of the deodorizing filter part **420** is increased, the hassle of replacing the filter may be eliminated. As a result, the convenience of use of the food waste disposer **1** may be improved.

FIG. **8** is an exploded view illustrating a filter device, a condensation chamber, a drainage device, and a base frame of a food waste disposer according to an embodiment. FIG. **9** is a rear view illustrating a filter device, a condensation chamber, a drainage device, and a base frame of a food waste disposer according to an embodiment. FIG. **10** is an enlarged view of portion A shown in FIG. **4**. FIG. **11** is a view illustrating a portion of a food waste disposer according to an embodiment. FIG. **12** is a view illustrating the portion of the food waste disposer shown in FIG. **11** in a different direction. FIG. **13** is a perspective view illustrating a condensation chamber of a food waste disposer according to an embodiment. FIG. **14** is a bottom perspective view illustrating a condensation chamber of a food waste disposer according to an embodiment.

The food waste disposer **1** may include the condensation chamber **200** and the filter device **400**.

The food waste disposer **1** may further include a drainage device **300** provided to collect and drain condensed water generated in the condensation chamber **200**.

The condensation chamber **200** may be provided to remove or reduce moisture in the exhaust gas flowing from the exhaust duct **110** to the catalytic filter part **410** of the filter device **400**. The condensation chamber **200** may be provided to condense the exhaust gas passing through the exhaust duct **110** to the catalytic filter part **410**.

The condensation chamber **200** may include a condensation passage **210***a* extending in one direction such that the exhaust gas flows. For example, the condensation passage **210***a* may be provided to extend in the left-right direction (the Y-direction). The exhaust gas introduced into the condensation chamber **200** may be provided to flow in one direction along the extension direction of the condensation passage **210***a* on the condensation passage **210***a*.

For example, the condensation chamber **200** may be provided between the filter device **400** and the storage case **82**. The condensation chamber **200** may be provided to extend in the left-right direction between the filter device **400** and the storage case **82**. The condensation chamber **200** may be arranged compactly between the filter device **400** and the storage case **82** while securing the condensation passage **210***a* through which the exhaust gas may flow. Accordingly, the usability of the internal space of the food waste disposer **1** may be increased.

The condensation chamber **200** may include a chamber body **210** forming the condensation passage **210***a* therein. The chamber body **210** may have a substantially box shape. However, the disclosure is not limited thereto, and the chamber body **210** may be provided in various shapes capable of securing the condensation passage **210***a* of a predetermined length.

The exhaust gas flowing into the condensation chamber **200** from the exhaust duct **110** may be provided to be condensed while flowing through the condensation passage **210***a*. For example, the relatively high temperature exhaust gas may be cooled while flowing through the relatively low temperature condensation passage **210***a* of the condensation chamber **200**. Accordingly, moisture included in the exhaust gas may be condensed and introduced into a drain tray **310** to be described below, and the exhaust gas having moisture reduced or removed may be introduced into the catalytic filter part **410** of the filter device **400**.

The condensation chamber **200** may include an inlet **211** provided at one side of the chamber body **210** such that exhaust gas from the exhaust duct **110** is introduced into the condensation passage **210***a*. The inlet **211** may be provided to be coupled to an end portion of the second duct part **112**. The inlet **211** may include a shape corresponding to the shape of the end portion of the second duct part **112**. For example, the inlet **211** may include a circular pipe shape.

The condensation chamber **200** may include an outlet **212** provided on the other side of the chamber body **210** such that the exhaust gas passed through the condensation passage **210***a* flows out to the catalytic filter part **410**. The outlet **212** may communicate with the drain tray **310** to be described below. Accordingly, the exhaust gas discharged through the outlet **212** may pass through the drain train **310** and then flow into the filter device **400** communicating with the drain tray **310**, and moisture condensed from the exhaust gas may be introduced into the drain tray **310** through the outlet **212**.

For example, the inlet **211** may be formed in the upper portion of the chamber body **210**, and the outlet **212** may be formed in the lower portion of the chamber body **210**. Accordingly, the exhaust gas may smoothly flow through the inlet **211**, the condensation passage **210***a*, and the outlet **212**, and the condensed water may fall downward through the outlet **212** formed in the lower portion of the chamber body **210** such that the condensed water may be easily collected in the drain tray **310**.

The condensation chamber **200** may include a partition plate **214** provided to divide the condensation passage **210***a* from the drain tray **310**.

For example, the partition plate **214** may include a shape substantially corresponding to that of the chamber body **210**. The partition plate **214** may include a plate shape extending in a substantially left-right direction. The partition plate **214** may be provided to partition at least a portion of the interior of the chamber body **210** having a lower side that is open. An upper inner surface **210***b* of the chamber body **210** and the partition plate **214** may form the condensation passage **210***a*. The partition plate **214** may be integrally formed with the chamber body **210**. Alternatively, the partition plate **214** may be formed separately from the chamber body **210** and coupled to the interior of the chamber body **210**.

For example, the partition plate **214** may partition a portion of the interior of the chamber body **210**, and an area not partitioned by the partition plate **214** may form the outlet **212**. However, the disclosure is not limited thereto, and the

outlet **212** may be provided as a separate part communicating with the condensation passage **210***a*.

For example, the partition plate **214** may include a shape that is inclined downward in a direction away from the inlet **211**. For example, the partition plate **214** may include a shape that is inclined downward in a direction closer to the outlet **212**. Accordingly, the exhaust gas may smoothly flow on the condensation passage **210***a*.

The condensation chamber **200** may include a base plate **215**. The base plate **215** may be seated on an upper side of the drain tray **310** to be described below. The base plate **215** may be provided at a lower side of the chamber body **210**. The base plate **215** may extend from a lower side of the chamber body **210**. That is, the base plate **215** may be provided as one body with the chamber body **210**. Alternatively, the base plate **215** may be formed separately from the chamber body **210** to be coupled thereto.

The condensation chamber **200** may include a filter mounting part **217** to which the filter device **400** may be mounted. The catalytic filter part **410** of the filter device **400** may be detachably mounted to the filter mounting part **217**. The filter mounting part **217** may be provided on the base plate **215**.

The filter mounting part **217** may be provided with a communication part **216**. The communication part **216** may be provided to communicate the drain tray **310** with the catalytic filter part **410** mounted on the filter mounting part **217**. For example, the communication part **216** may be formed to pass through a portion of the base plate **215**. Exhaust gas having moisture removed while passing through the condensation passage **210***a* may be introduced into a flow-in part **416** of the catalytic filter **410** through the communication part **216**.

The filter mounting part **217** may be provided with a coupling part **218**. The coupling part **218** of the filter mounting part **217** may be provided to be coupled to a coupling part **418** of the catalytic filter **410**. For example, the coupling part **218** and the coupling part **418** may each be provided with a hole, and a separate fastening member may be provided to be coupled to each hole. However, the disclosure is not limited thereto, and various coupling methods may be used.

The condensation chamber **200** may include a reinforcing member **219**. The reinforcing member **219** may be provided on an inner wall of the chamber body **210** to reinforce the rigidity of the chamber body **210**. The reinforcing member **219** may be provided in plural, and the plurality of reinforcing members **219** may be arranged to be spaced apart from each other.

The condensation chamber **200** may include a baffle plate **220** provided in the condensation passage **210***a* to obstruct the flow of exhaust gas. By including the baffle plate **220**, the condensation chamber **200** may more effectively condense the exhaust gas flowing through the condensation passage **210***a*. For example, since the baffle plate **200** obstructs the flow of the exhaust gas, a predetermined time for the exhaust gas to stay in the condensation passage **210***a* may be secured, so that the exhaust gas may be effectively cooled while flowing through the condensation passage **210***a*. That is, moisture contained in the exhaust gas may be effectively removed.

The baffle plate **220** may include a plurality of through holes **222***h* and **223***h*. The plurality of through holes **222***h* and **223***h* may be provided to reduce a flow loss of the exhaust gas passing through the condensation passage **210***a*. Details thereof will be described below.

Referring to FIGS. **8** to **12**, the drainage device **300** may include the drain tray **310** and the drain pipe **320**.

The drain tray **310** may be disposed at a lower side of the condensation chamber **200** inside the housing **10**. The drain tray **310** may be provided to collect condensed water generated in the condensation chamber **200**.

The drain tray **310** may be provided to communicate with each of the condensation chamber **200** and the catalytic filter part **410**. For example, the drain tray **310** may be provided to communicate with the outlet **212** and the flow-in part **416** of the catalytic filter part **410**, respectively.

The exhaust gas passed through the condensation chamber **200** may pass through the drain tray **310** and then flow to the catalytic filter part **410**. In this process, moisture separated from the exhaust gas may be accommodated in the drain train **310**, and the exhaust gas from which moisture has been removed may be introduced into the catalytic filter part **410**.

The drain tray **310** has a drain hole **314** through which the condensed water collected from the condensation chamber **200** is drained, and a bottom surface part **313** forming a recess **312** in which the condensed water collected from the condensation chamber **200** is accommodated. The drain hole **314** may be provided to drain the condensed water accommodated in the recess **312**. The drain hole **314** may be disposed adjacent to the rear side of the housing **10**.

For example, the recess **312** may extend in the front-rear direction (the X direction).

For example, the drain hole **314** may be formed to pass through the bottom surface part **313**.

The bottom surface part **313** may include a shape inclined downward as being directed to the drain hole **314** such that the condensed water is easily drained. For example, one side of the bottom surface part **313** in which the drain hole **314** is formed may be provided to be lower than the other side of the bottom surface part **313** in which the drain hole **314** is not formed. Thereby, a smooth gradient may be achieved. For example, the bottom surface part **313** may be provided to be inclined downward as being directed to the rear of the housing **10**.

The drain tray **310** may include a plate seating part **311**. The condensation chamber **200** may be seated on the plate seating part **311**. For example, the plate seating part **311** may be provided to support the base plate **215** of the condensation chamber **200**. The plate seating parts **311** may be provided on both sides of the recess **312** in the left-right direction (the Y direction). The plate seating parts **311** may extend in the front-rear direction (the X direction).

The drain tray **310** may include a drain port **315** extending from the drain hole **314**. The drain port **315** may communicate with the drain hole **314**. The drain pipe **320** may be connected to the drain port **315**, and condensed water discharged from the drain hole **314** may be introduced into the drain pipe **320** through the drain port **315**.

Meanwhile, the drain tray **310** may be disposed on the upper side of the base frame **11** of the housing **10**. The drain tray **310** may be detachably mounted to the housing **10**. The drain tray **310** may be detachably mounted to the base frame **11**.

The base frame **11** may include a shape corresponding to the shape of the drain tray **310**. For example, the base frame **11** may include a seating part counterpart **11***a* corresponding to the plate seating part **311** and a recess counterpart **11***b* corresponding to the recess **312**. The recess counterpart **11***b* may be provided to be inclined downward as being directed to the rear of the housing **10**.

The drain pipe **320** may be connected to the drain hole **314** of the drain tray **310**. The drain pipe **320** may be coupled to the drain port **315** of the drain tray **310** and provided to communicate with the drain hole **314**. The drain pipe **320** may be provided to discharge the condensed water contained in the drain tray **310** to the outside of the housing **10**.

For example, the drain pipe **320** may have one end **321** connected to the drain port **315**, and the other end **322** connected to a cap **17**. Alternatively, the drain pipe **320** may have one end **321** connected to the drain port **315**, and the other end **322** connected to a separate drain hose (not shown).

The filter device **400** may include the catalytic filter part **410** and the deodorizing filter part **420**.

The catalytic filter part **410** may include the catalytic filter **411** provided to sterilize or deodorize exhaust gas through a catalytic reaction.

The catalytic filter part **410** may include a catalytic filter case **412** provided to accommodate the catalytic filter **411**. The catalytic filter case **412** may form the exterior of the catalytic filter part **410**.

The catalytic filter case **412** may include a case hole **412***h*. For example, the case hole **412***h* may be provided to cool the heat generated when the catalytic filter **411** is used. For example, the case hole **412***h* may prevent a temperature increase due to heat generation of a light emitting member **423**, which will be described below. The case hole **412***h* may allow the heat inside the catalytic filter case **412** to escape to the outside of the catalytic filter case **412**, thereby lowering the temperature of the catalytic filter case **412**.

For example, the catalytic filter **411** may be provided as a photocatalytic filter. The catalytic filter **411** may include a photocatalytic filter including a base and a photocatalytic applied to the base. For example, the photocatalytic including at least one of titanium dioxide, tungsten trioxide, manganese dioxide, and zinc oxide may be applied to the base including ceramic material. However, the disclosure is not limited thereto, and the catalytic filter **411** may be provided as a photocatalytic filter of various materials.

The catalytic filter part **410** may include the light emitting member **413** for photocatalytic reaction of the catalytic filter **411**. For example, the light emitting member **413** may include a substrate **413***a* and a light source **413***b* mounted on the substrate **413***a* to transmit light toward the catalytic filter **411**. The light source **413***b* may be provided to emit ultraviolet rays. The light emitting member **413** may be disposed to face the catalytic filter **411**.

The catalytic filter part **410** may include a catalytic filter frame **414** provided to support the catalytic filter **411**. The catalytic filter frame **414** may stably fix the catalytic filter **411**.

For example, the catalytic filter frame **414** may include a supporter **415** provided to support the light emitting member **413**. For example, the supporter **415** may extend from the catalytic filter frame **414** and protrude toward the light emitting member **413**. The supporter **415** may include a hook shape provided to be caught on the substrate **413***a*.

The catalytic filter part **410** may include the flow-in part **416** through which the exhaust gas passed through the condensation chamber **200** is introduced, and a flow-out part **417** through which the exhaust gas passed through the deodorizing filter **411** flows out.

For example, the flow-in part **416** may be formed at a lower portion of the catalytic filter case **412**, and the flow-out part **417** may be formed at an upper portion of the catalytic filter case **412** to correspond to the deodorizing filter part **420**. The exhaust gas passed through the condensation chamber **200** may flow from the lower side to the upper side of the catalytic filter **411**.

For example, the flow-in part **416** of the catalytic filter part **410** may be provided to communicate with the communication part **216** of the condensation chamber **200**. For example, the flow-in part **416** of the catalytic filter part **410** may be formed by mounting the catalytic filter case **412**, which has an open bottom, on the filter mounting part **217** of the condensation chamber **200**. For example, the flow-in part **416** of the catalytic filter part **410** may be formed by the communication part **216** of the condensation chamber **200**.

The catalytic filter part **410** may include the coupling part **418** coupled to the coupling part **218** of the condensation chamber **200**. For example, the coupling part **418** of the catalytic filter part **410** may be formed along the circumference of the catalytic filter case **412**. For example, the coupling part **418** of the catalytic filter part **410** may be provided in plural, and the coupling part **218** of the condensation chamber **200** may be provided in plural to correspond to the plurality of coupling parts **418** of the catalytic filter part **410**.

The deodorizing filter part **420** may be disposed on the upper side of the catalytic filter part **410**. The exhaust gas flowing upward may pass through the catalytic filter part **410** and then flow into the deodorizing filter part **420**.

The deodorizing filter part **420** may include the deodorizing filter **421** provided to remove the odor of the exhaust gas. The deodorizing filter **421** may adsorb odor particles in the exhaust gas. For example, the deodorizing filter **421** may include an activated carbon filter and a ceramic filter.

The deodorizing filter part **420** may include a deodorizing filter case **422** provided to accommodate the deodorizing filter **421**. The deodorizing filter case **421** may form the external appearance of the deodorizing filter part **420**.

The deodorizing filter part **420** may include a deodorizing filter frame **423** provided to support the deodorizing filter **421**. The deodorizing filter frame **423** may prevent the deodorizing filter **421** from being separated downward toward the catalytic filter part **410**. The deodorizing filter frame **423** may stably fix the deodorizing filter **421**.

The deodorizing filter part **420** may include a flow-in part **424** through which the exhaust gas passed through the catalytic filter **411** flows in, and a flow-out part **425** through which the exhaust gas passed through the deodorizing filter **421** flows out.

The flow-out part **425** of the deodorizing filter part **420** may be provided to correspond to the exhaust hole **14** formed in the rear side of the housing **10**. The flow-out part **425** may be provided to communicate with the outside of the housing **10**. The filtered exhaust gas may be discharged to the outside of the housing **10** through the flow-out part **425**.

For example, the flow-in part **424** may be formed at a lower portion of the deodorizing filter case **422**, and the flow-out part **425** may be formed at an upper portion of the deodorizing filter case **422**. The exhaust gas passed through the catalytic filter **411** may flow from the lower side to the upper side of the deodorizing filter **421**.

FIG. **15** is an exploded view illustrating a rear portion of a food waste disposer according to an embodiment.

Referring to FIG. **15**, the housing **10** may include an opening **15** provided at a rear side thereof. For example, the base frame **11** may include an opening **15***b*, and the side frame **12** may include an opening **15***a*. The opening **15***b* of the base frame **11** may be provided to correspond to the opening **15***a* of the side frame **12**. The opening **15***b* of the base frame **11** may have a size and shape corresponding to those of and the opening **15***a* of the side frame **12**.

The opening **15***b* of the base frame **11** and the opening **15***a* of the side frame **12** may form a service opening **15** that allows the inside of the housing **10** to be assessable from the outside of the housing **10**. Hereinafter, both the opening **15***b* of the base frame **110** and the opening **15***a* of the side frame **12** may be referred to as a service opening **15**.

The service opening **15** may be provided to allow access to the drain tray **310** disposed inside the housing **10** from the outside of the housing **10**. The service opening **15** may be formed in the rear of the housing **10** corresponding to the drain tray **310**.

The housing **10** may include a service cover **16** provided to cover the service opening **15**. The service cover **16** may be provided at the rear of the housing **10**. The service cover **16** may be detachably mounted to the rear of the housing **10**.

The service cover **16** may include a cover body **161**. The cover body **161** may have a shape and size corresponding to those of the service opening **15**.

The service cover **16** may include a locking protrusion **162** provided to be caught on a locking holder **11***c* of the housing **10**.

The service cover **16** may include a fixing protrusion **163** protruding from the cover body **161** toward the service opening **15**. The fixing protrusion **163** may be provided to be fixed to a fixing holder **316** provided inside the housing **10**. For example, the fixing holder **316** may be formed at the rear of the drain tray **310**.

For example, the user may couple the fixing protrusion **163** of the service cover **16** to the fixing holder **316** in a state in which the locking protrusion **162** of the service cover **16** is inserted into the locking holder **11***c*.

The service cover **16** may further include a hole **164** into which the cap **17** is inserted. The cap **17** may pass through the hole **164** to be coupled to the other end **322** of the drain pipe **320**. For example, the user may separate the cap **17** from the drain pipe **320** and connect a separate drain hose to the other end **322** of the drain pipe **320**.

FIGS. **16** to **23** are cross-sectional views illustrating a condensation chamber and a drain tray of a food waste disposer according to various embodiments.

The condensation chamber **200** may be provided to exchange heat with the exhaust gas introduced from the exhaust duct **110**. For example, the exhaust gas may be caused to lose heat by the condensation chamber **200** while flowing in the first direction (the Y direction) in the condensation passage **210***a* of the condensation chamber **200**. That is, the exhaust gas may be cooled and condensed while flowing through the condensation passage **210***a*.

FIGS. **17** to **23**, the condensation chamber **200** may include a baffle plate **220** provided in the condensation passage **210***a* to obstruct the flow of exhaust gas. The baffle plate **200** may obstruct the flow of the exhaust gas flowing into the chamber body **210** to secure a predetermined time for the exhaust gas to stay in the condensation passage **210***a*. Accordingly, the efficiency of heat exchange of the exhaust gas with the condensing chamber **200** may be increased, and the exhaust gas may be cooled more effectively.

Referring to FIG. **17**, the baffle plate **220** may include a first plate **221**. The first plate **221** may extend in a second direction (the Z direction) crossing the first direction (the Y direction). The first plate **221** may extend in the vertical direction.

The first plate **221** may be provided to block the condensation passage **210***a*. The first plate **221** may be provided to partition a portion of the condensation passage **210***a*.

The first plate **221**, i.e., **221***b* may extend downward from the upper inner surface **210***b* of the chamber body **210**. The first plate **221**, i.e., **221***a* may extend upward from the partition plate **214**.

The first plate **221** may be integrally formed with the chamber body **210** or the partition plate **214**. However, the disclosure is not limited thereto, and the first plate **221** may be provided separately from each of the chamber body **210** and the partition plate **214**, and coupled to the inside of the chamber body **210**.

For example, the first plate **221** may be provided in plural. For example, the first plate **221** may include a first-A plate **221***a* and a first-B plate **221***b*. The first-A plate **221***a* may extend upward from the partition plate **214**, and the first-Bb plate **221***b* may extend downward from the upper inner surface **210***b* of the chamber body **210**. The first-A plate **221***a* and the first-B plate **221***b* may be alternately disposed, to form the condensation passage **210***a* in a zigzag shape. The first-A plate **221***a* and the first-B plate **221***b* may cause the condensing passage **210***a* to be meandering.

Meanwhile, in the drawings, the first-A plate **221***a* is disposed adjacent to the inlet **211** and the first-B plate **221***b* is disposed farther from the inlet **211** than the first-A plate **221***a* is, but the disclosure is not limited thereto. For example, the first-B plate **221***b* may be disposed closer to the inlet **211** than the first-A plate **221***a* is.

In FIG. **17**, the first plate **221** is illustrated as two first plates, but the disclosure is not limited thereto, and the first plate **221** may be provided as a single first plate, or as three or more first plates.

In addition, although each of the first-A plate **221***a* and the first-B plate **221***b* is illustrated as one unit thereof, the disclosure is not limited thereto. The first plate **221** may include at least one of the first-A plate **221***a* and the first-B plate **221***b*. The first plate **221** may be provided as a single first-A plate **221***a*. The first plate **221** may be provided as a single first-B plate **221***b*. The first-A plate **221***a* may be provided in one unit thereof and the first-B plate **221***b* may be provided in two or more units thereof. The first-A plate **221***a* may be provided in two or more units thereof and the first-B plate **221***b* may be provided in one unit thereof. Each of the first-A plate **221***a* and the first-B plate **221***b* may be provided in two or more units thereof.

Referring to FIG. **18**, the baffle plate **220** may include a second plate **222**. The second plate **222** may extend along the condensation passage **210***a*. The second plate **222** may extend in the first direction (the Y direction).

For example, the second plate **222** may be provided on substantially the same line as the partition plate **214**. The second plate **222** may be arranged in a line with the partition plate **214** in the first direction (the Y direction). The second plate **222** may be provided to divide the condensation passage **210***a* from the drain tray **310**.

For example, the second plate **222** may be disposed on the outlet **212**. Accordingly, the exhaust gas passed through the condensation passage **210***a* may be discharged through a through hole **222***h* of the second plate **222**, which will be described below. That is, the through hole **222***h* of the second plate **222** may be provided as the outlet **212**.

The second plate **222** may be integrally formed with the chamber body **210** or the partition plate **214**. However, the disclosure is not limited thereto, and the second plate **222** may be provided separately from each of the chamber body **210** and the partition plate **214**, and coupled to the interior of the chamber body **210**.

The second plate **222** may have a shape inclined downward in a direction away from the inlet **211**. The second plate

222 may have a shape inclined downward in a direction approaching the outlet **212**. Accordingly, the exhaust gas may smoothly flow on the condensation passage **210***a*.

The second plate **222** may include a plurality of through holes **222***h*. When the baffle plate **220** obstructs the flow of the exhaust gas, the condensation effect may be improved, but the exhaust gas may have a flow loss. Since the second plate **222** includes the plurality of through-holes **222***h*, the flow loss of the exhaust gas may be reduced wile securing the effect of condensing the exhaust gas. As the exhaust gas passes through the plurality of through-holes **222***h*, the flow rate may be increased. Accordingly, the total flow rate of the exhaust gas passing through the condensation chamber **220** may not decrease.

The plurality of through-holes **222***h* may be provided to be arranged along the condensation passage **210***a*.

The exhaust gas, while flowing in the first direction (the Y direction) along the condensation passage **210***a*, passing through the through holes **222***h* of the second plate **222**, flows into the drain tray **310**.

Referring to FIG. **19**, the baffle plate **220** may include a third plate **223**. The third plate **223** may extend in the second direction (the Z direction) crossing the first direction (the Y direction). The third plate **223** may extend in the vertical direction.

The third plate **223** may be provided to block the condensation passage **210***a*. The third plate **223** may be provided to partition at least a portion of the condensation passage **210***a*. The third plate **223** may be provided to extend in the vertical direction between the upper inner surface **210***b* of the chamber body **210** and the partition plate **214**.

The third plate **223** may be integrally formed with the chamber body **210** or the partition plate **214**. However, the disclosure is not limited thereto, and the third plate **223** may be provided separately from each of the chamber body **210** and the partition plate **214**, and coupled to the interior of the chamber body **210**.

For example, the third plate **223** may be provided in plural. The plurality of third plates **223** may be arranged to be spaced apart from each other in the first direction (the Y direction).

In FIG. **19**, the third plate **223** is illustrated as two third plates **223**, but the disclosure is not limited thereto. The third plate **223** may be provided as a single third plate **223** or three or more third plates **223**.

The third plate **223** may include a plurality of through holes **223***h*. When the baffle plate **220** obstructs the flow of the exhaust gas, the condensation effect may be improved, but the exhaust gas may have a flow loss. Since the third plate **223** includes the plurality of through holes **223***h*, the flow loss of the exhaust gas may be reduced while securing the effect of condensing the exhaust gas. As the exhaust gas passes through the plurality of through holes **223***h*, the flow rate of the exhaust gas may be increased. Accordingly, the total flow rate of the exhaust gas passing through the condensation chamber **220** may not decrease.

The exhaust gas, while flowing in the first direction along the condensation passage **210***a*, passing through the through holes **223***h* of the third plate **222**, flow into the drain tray **310**.

Referring to FIG. **20**, the baffle plate **220** may include the second plate **222** and the third plate **223**. The same components may be assigned the same reference numerals, and the same descriptions may be omitted.

For example, the second plate **222** may be disposed in the horizontal direction, and the third plate **223** may be disposed in the vertical direction. The second plate **222** may be arranged in a line with the partition plate **214** in the first direction (the Y direction). The second plate **222** may be provided to divide the condensation passage **210***a* from the drain tray **310**. The third plate **223** may be provided to block the condensation passage **210***a*.

The exhaust gas may pass through the second plate **222** and the third plate **223** and flow into the drain tray **310**. The exhaust gas may be introduced into the drain tray **310** by passing through the plurality of through holes **222***h* of the second plate **222** and the plurality of through holes **223***h* of the third plate **223**. As the exhaust gas passes through the plurality of through holes **222***h* and **223***h*, the flow rate of the exhaust gas may be increased.

In FIG. **20**, each of the second plate **222** and the third plate **223** is illustrated as one unit thereof, but the disclosure is not limited thereto. The second plate **222** may be provided as one unit thereof, and the third plate **223** may be provided in two or more units thereof. The second plate **222** may be provided in two or more units thereof, and the third plate **223** may be provided in one unit thereof. Each of the second plate **222** and the third plate **223** may be provided in two or more units thereof.

For example, when the second plate **222** is provided in plural, each of the plurality of second plates **222** may be arranged in a line along the first direction (the Y direction).

For example, when the third plates **223** is provided in plural, the plurality of third plates **223** may be disposed to be spaced apart from each other in the first direction (the Y direction).

Referring to FIG. **21**, the baffle plate **220** may include the first plate **221** and the second plate **222**. The same components may be assigned the same reference numerals, and the same descriptions may be omitted.

For example, the first plate **221** may be disposed in the vertical direction, and the second plate **222** may be disposed in the horizontal direction. The first plate **221** may be provided to partition a portion of the condensation passage **210***a*. The second plate **222** may be arranged in a line with the partition plate **214** in the first direction (the Y direction). The second plate **222** may be provided to divide the condensation passage **210***a* from the drain tray **310**.

The exhaust gas may pass through the plurality of through holes **222***h* of the second plate **222** and flow into the drain tray **310**. As the exhaust gas passes through the plurality of through-holes **222***h*, the flow rate of the exhaust gas may be increased.

In FIG. **21**, the first plate **221** is illustrated as two units thereof and the second plate **222** is illustrated as one unit thereof, but the disclosure is not limited thereto. The first plate **221** may be provided in one unit or two or more units thereof. The second plates **222** may be provided in two or more units thereof.

The first plate **221** may allow the exhaust gas to meander along the condensation passage **210***a*.

Referring to FIG. **22**, the baffle plate **220** may include the first plate **221** and the third plate **223**. The same components may be assigned the same reference numerals, and the same descriptions may be omitted.

For example, the first plate **221** and the third plate **223** may be disposed in the vertical direction. The first plate **221** may be provided to partition a portion of the condensation passage **210***a*. The third plate **223** may be provided to partition at least a portion of the condensation passage **210***a*.

The first plate **221**, i.e., **221***b* may extend downward from the upper inner surface **210***b* of the chamber body **210**. The first plate **221**, i.e., **221***a* may extend upward from the partition plate **214**. The third plate **223** may be provided to

extend in the vertical direction between the upper inner surface **210***b* of the chamber body **210** of the condensation passage **210***a* and the partition plate **214**.

The first plate **221** and the third plate **223** may be alternately disposed. For example, referring to FIG. **22**, based on the flow direction of the exhaust gas, the third plate **223**, the first-A plate **221***a*, the third plate **223**, and the first-B plate **221***b* may be disposed in the order. However, the disclosure is not limited thereto, and the reverse order may also possible. In addition, the first plate **221** may be disposed on an upstream side of the third plate **223**.

The first plate **221** may allow the exhaust gas to meander along the condensation passage **210***a*.

As the exhaust gas passes through the plurality of through-holes **223***h*, the flow rate of the exhaust gas may be increased.

Referring to FIG. **23**, the baffle plate **220** may include the first plate **221**, the second plate **222**, and the third plate **223**. The same components may be assigned the same reference numerals, and the same descriptions may be omitted.

For example, the first plate **221** and the third plate **223** may be disposed in the vertical direction. The first plate **221** may be provided to partition a portion of the condensation passage **210***a*. The third plate **223** may be provided to partition at least a portion of the condensation passage **210***a*. The second plate **222** may be disposed in the horizontal direction.

The first plate **221** and the third plate **223** may be alternately disposed.

The first plate **221** may allow the exhaust gas to meander along the condensation passage **210***a*.

The second plate **222** may be provided to divide the condensation passage **210***a* from the drain tray **310**.

The exhaust gas may pass through the plurality of through holes **222***h* and **223***h* and flow into the drain tray **310**. As the exhaust gas passes through the plurality of through holes **222***h* and **223***h*, the flow rate of the exhaust gas may be increased.

As is apparent from the above, according to one aspect of the disclosure, the food waste disposer can be provided with a longer filter replacement cycle.

According to one aspect of the disclosure, the food waste disposer can improve the performance of the filter device by removing moisture from the exhaust gas before the exhaust gas flows into the filter device.

According to one aspect of the disclosure, the food waste disposer can have an improved structure of reducing a flow loss of exhaust gas.

According to one aspect of the disclosure, the food waste disposer can easily drain the condensed water.

Although certain illustrative embodiments and implementations have been described herein, other embodiments and modifications will be apparent from this description. Accordingly, the inventive concepts are not limited to such embodiments, but rather to the broader scope of the appended claims and various obvious modifications and equivalent arrangements as would be apparent to a person of ordinary skill in the art.

What is claimed is:

1. A food waste disposer comprising:

a housing;

a container disposed inside the housing to accommodate food waste;

an exhaust duct communicating with the container to allow exhaust gas generated in the container to flow therein;

a filter device including:

a catalytic filter part configured to filter the exhaust gas passed through the exhaust duct; and

a deodorizing filter part configured to filter the exhaust gas passed through the catalytic filter part and communicating with an outside of the housing; and

a condensation chamber configured to remove moisture in the exhaust gas flowing from the exhaust duct into the catalytic filter part of the filter device, the condensation chamber including:

a condensation passage formed by extending in one direction to allow the exhaust gas to flow therethrough; and

a baffle plate placed in the condensation passage to change a flow of the exhaust gas, the baffle plate including a plurality of through holes which the exhaust gas passes through.

2. The food waste disposer of claim **1**, further comprising a drain tray disposed at a lower side of the condensation chamber in the housing to collect condensed water generated in the condensation chamber.

3. The food waste disposer of claim **2**, wherein the baffle plate extends along the condensation passage, and the plurality of through holes are arranged along the condensation passage.

4. The food waste disposer of claim **2**, wherein the condensation chamber includes:

a chamber body forming the condensation passage therein;

an inlet provided at one side of the chamber body, and communicating with the exhaust duct to introduce the exhaust gas from the exhaust duct into the condensation passage; and

an outlet provided at an other side of the chamber body, and communicating with the drain tray to discharge the exhaust gas passed through the condensation passage to the drain tray.

5. The food waste disposer of claim **2**, wherein the one direction is a first direction, and

the baffle plate is disposed in a second direction crossing the first direction to block the condensation passage.

6. The food waste disposer of claim **5**, wherein the baffle plate includes a plurality of baffle plates, and the plurality of baffle plates are spaced apart from each other.

7. The food waste disposer of claim **4**, wherein the condensation chamber further includes a reinforcer provided on an inner wall of the chamber body to reinforce a rigidity of the chamber body.

8. The food waste disposer of claim **7**, wherein the inlet is formed in an upper portion of the chamber body, and the outlet is formed in a lower portion of the chamber body.

9. The food waste disposer of claim **2**, wherein the drain tray communicates with each of the condensation chamber and the catalytic filter part, and

the exhaust gas passed through the condensation chamber flows to the catalytic filter part through the drain tray.

10. The food waste disposer of claim **2**, wherein the drain tray further includes:

a drain hole through which the condensed water collected from the condensation chamber is drained; and

a bottom surface part configured to form a recess for accommodating the condensed water collected from the condensation chamber, and provided to be inclined downward toward the drain hole.

11. The food waste disposer of claim **2**, wherein the drain tray comprises a drain hole formed therein, and the food waste disposer further comprises a drain pipe connected to

the drain hole to discharge the condensed water drained from the drain hole to the outside of the housing.

12. The food waste disposer of claim **1**, further comprising an exhaust fan to communicate with the exhaust duct to form an intake airflow from the container toward the filter device.

13. The food waste disposer of claim **1**, wherein the catalytic filter part includes:

a filter case to accommodate a catalytic filter therein; and

a light emitter provided in the filter case to face the catalytic filter and to irradiate the catalytic filter when the catalytic filter is in accommodated in the filter case.

14. The food waste disposer of claim **13**, wherein the filter case includes a case hole formed therein to lower a temperature of the filter case by releasing heat generated by the light emitter through the case hole.

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